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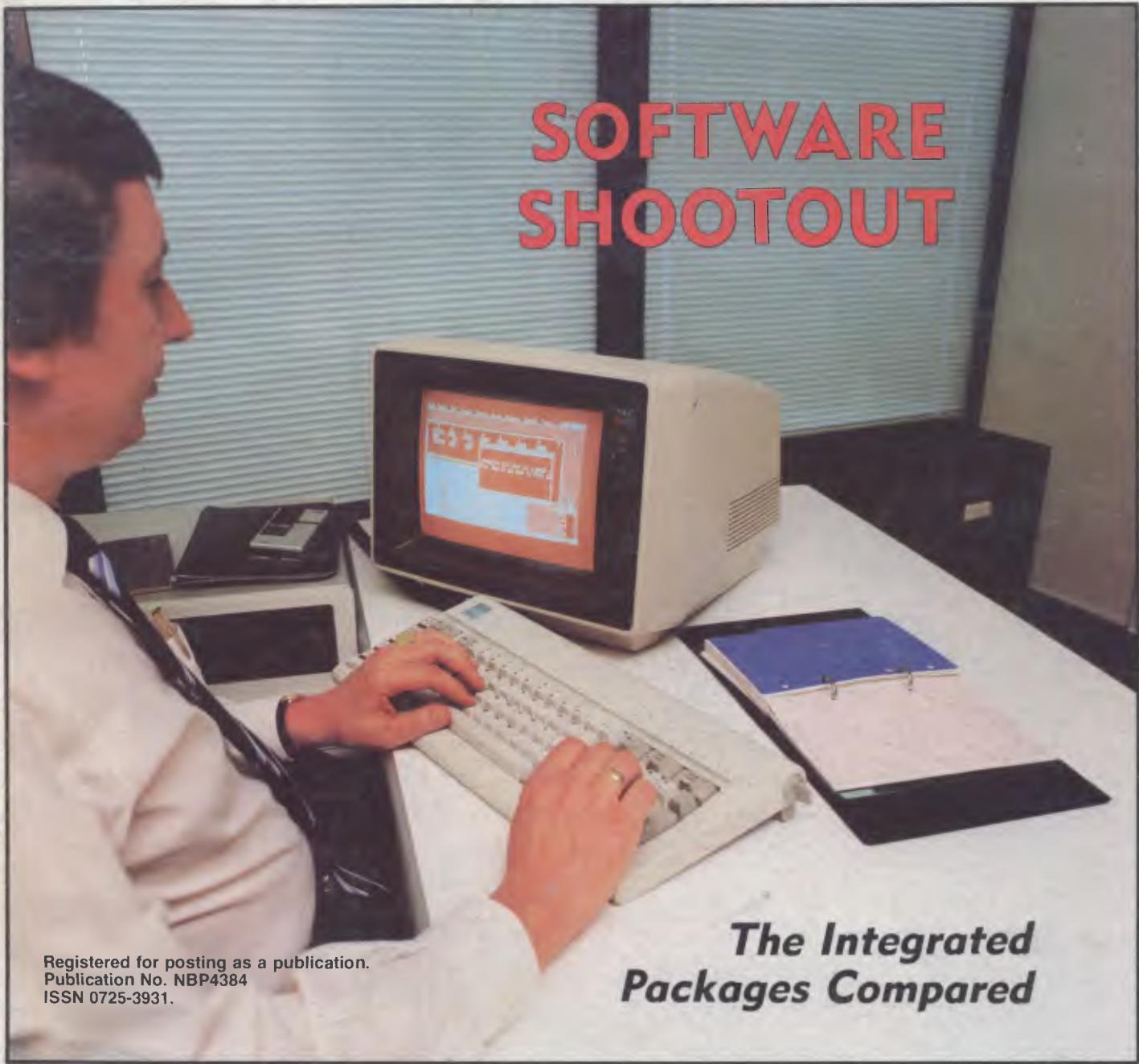
YOUR computer

DECEMBER 1984

MAGAZINE

FOR BUSINESS AND PLEASURE

SOFTWARE SHOOTOUT



*The Integrated
Packages Compared*

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FRAMEWORK ★ SYMPHONY ★ OPEN ACCESS ★ AURA
BUSINESS SECTION ★ LOTUS HOTLINE
REVIEWS:

NEC APC III ★ PORTAPAK MICRODRIVE BEE ★ H-P THINKJET

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DXY880 Plotter

DXY880 Plotter

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8-pen plotter for low cost, multi-color applications. The newly released DXY 880, with its increased speed and accuracy (0.05mm), in-built buffer plus Hewlett - Packard (H-P7470/7475) software compatibility, is ideal for most CAD and intricate business applications.

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SOFTWARE SHOOTOUT

Les Bell introduces our integrated software special with a discussion of the packages available and what to expect from them.

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LES BELL

FRAMEWORK FOR SUCCESS

Framework is more freeform than its major opposition, which is perhaps why our band of writers liked it.

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THE INTEGRATOR, INTEGRATED

Symphony is the integrated package based on the integrated package which started it all ... it has to be off to a good start, even if it can be a little frightening at first.

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Open Access is often painfully slow, but it has some capabilities which leave the others in the shade.

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LES BELL

A SIMPLE AURA

Aura is the simplest of the packages to use, but once you know your way around it can be tedious. The first-time user, however, will like both its design and its documentation.

44

LES BELL



YOUR BUSINESS COMPUTER



It's only recently that cultivating plants for sale has become regarded as an 'industry' — but there are already several computer programs catering for nursery owners and landscapers. The 'lazy gardener', Don Burke, takes a look at some of them.

In this issue we also cover the process of becoming an 'electronic boss', look in detail at the Compaq computer company and an integrated business package called the 'Electronic Desk', and focus on the video movie business as a new area for computer applications.



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your computer



FEATURES



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THE LABTAM IS NEARLY YOURS! 53

Who has won our Labtam? Quick, the answer! Now! No, not now — judging the stack of complex entries has proved a time-consuming task, so we preview next issue's announcement here...

APRICOT PIPS IBM 86

We reviewed the Apricot computer quite favourably earlier this year, and now the company has brought out a whole range, including a portable and networking capacity. It's even got Lotus ported to the range — which is one in the eye for IBM.

MARTIN HAYMAN

PROGRAMMER'S WORKBENCH 91

Les writes a program to create a menu-driven system on the IBM PC, finds a better way to address envelopes on a printer, looks at some new IBM software, and ends up bobbing on the harbour.

LES BELL

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Applied Technology's MicroBee is not only helping the handicapped to be computer users — it's also providing them with work. We visit the Bee's unusual production line.

EVAN McHUGH

EXPANDING YOUR IBM PC 123

Tired of trying to fit big programs on your IBM PC disks? Peter Harris shows how to double your storage space with a conversion to 96 tpi drives.

PETER HARRIS

APC III



HP THINKJET

REVIEWS

NEC'S NOT-ME-TOO 54

NEC's successor to the 1983 Personal Computer Of The Year goes under the microscope. Is non-compatibility justifiable these days? NEC thinks so, if you can have performance instead.

FRANK LEE

THE PORTAPAK 102

Fast, spacious, easy on the eyes, all-Australian (yet bilingual), this machine has plenty of oomph and should do well for the Portable Computer Company.

FRANK LEE

HP'S THINKJET PRINTER 111

Silent mite, print it right ... HP's Thinkjet printer restores sanity to our matriarched office.

JON FAIRALL

MICROBEE'S MICROFLOPPIES 128

Applied Technology is always busy beeing up-to-date. Now it's microfloppies you can hide in your bookshelf.

EVAN McHUGH



CONSULTING EDITOR

Les Bell

ASSISTANT EDITORS

Natalie Filatoff, Evan McHugh

NEWS EDITOR

Rose Vines

ART & DESIGN

Ali White

ART PRODUCTION

Sharon Hill, Vicki Jones, Brian Jones

AD PRODUCTION

Peter Maxwell

EDITOR-IN-CHIEF

Jane Mackenzie

MANAGING EDITOR

Jameson Rowe

PUBLISHER

Michael Hannan

CONTRIBUTORS

Australia: Brendan Akhurst, Bill Boltor, Lloyd Borrett, David Brudenall, Geoff Cohen, Andrew Farrell, Frank Lee, Peter Lynden, Bruce Mitchell, Mike Newnham, John Nicholls, Tzu-Pei Chen, Jeff Richards, Rod Stevenson, Ernie Sugrue, Dom Swinkels, Bradley Thirkettle. United States: Howard A. Karten.

OFFICE SERVICES

Elizabeth Barnett

SUBSCRIPTION ENQUIRIES

Julie Plummer

ADVERTISING

David McDowell (National Advertising Manager)

Damien Prins, Andrea Beatty (NSW Advertising)

David Farrington, Eric Baines (Victorian Advertising)

OFFICES**NSW**

140 Joynton Ave, Waterloo 2017.
(02) 663-9999
Telex: FEDPUB AA74488

VICTORIA

150 Lonsdale St, Melbourne 3000.
(03) 662-1222
Telex: FEDPUB AA34340

WESTERN AUSTRALIA

Ian Greenacre, Gordon & Gotch Adv't, 134-144 Parry St, Perth 6000.
(09) 328-8044

QUEENSLAND

Craig Santilla, Media Services, 4 Adelaide Terrace, Brisbane 4000.
(07) 229-6033

SOUTH AUSTRALIA

Steve Birbeck, Admedia Group, 24 Kensington Rd, Rose Park 5067.
(08) 332-8144

NEW ZEALAND

Chris Horsley, 4A Symonds Court, Symonds St, Auckland, NZ.
Telex: TEXTURE 260753

Source Mail: Les Bell TCY314; Matt Whelan TCY267.

Bulletin Board: (02) 662-1686 – Les Bell 1085; Matt Whelan 1; or leave a message in comments.

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Telecom Local Charges

Telecom recently raised the spectre of the possibility of making charges for local calls dependent on the length of the call, a practice which is current in many other countries.

Quoting a McKinsey and Co (the management consultants) study, which suggested that Telecom's local charges were too low and STD charges too high, Telecom spokesmen have consistently denied that the organisation currently plans to introduce time-metered local calls – but have never denied that a decision might be made in the near future which would change this.

The fact is that, from the consumer's viewpoint, charges can never be too low. This is particularly true in the case of our telephone service, which is run by a monopoly, thus removing the law of supply and demand as a price determination mechanism. If the price goes up, we can't stop using the phone, nor is there much point in complaining.

One group which will be particularly badly hit is that which uses modems over the public switched telephone network. Just when the benefits of information technology are becoming available to small businesses and individuals, Telecom seems likely to move to price it beyond our reach again.

Of course, the powers that be will point to the alternatives – DDN, Austpac and the like – which are unfortunately geared to a rather higher level of usage and higher-priced terminal equipment than is appropriate.

And if – as we are told – information and information technology are the key to future business success, all this will do is further divide our society into the information-rich and the information-poor, with the poor unable to get any more because the costs are stacked against them, thanks to Telecom.

In any case, the cost of providing a local telephone service has little relation to the length of your calls and everything to do with the cost of the capital equipment involved, such as exchanges and cables. It costs money whether you use the phone or not.

And finally, where does a US-based management consultancy get the idea that our local calls are too cheap, when in the US local calls are free! Now you can see why the US is the dominant force in dial-up database technology, with The Source, CompuServe, Dow Jones News Retrieval, the Knight-Rider experimental systems, and so on. Over here, we won't be able to afford to talk to such systems.

No, local calls must stay at low cost.

Les Bell

Give yourself a break ...



How many activities are you doing at the moment? Reading, listening, thinking. Why shouldn't your Personal Computer be as versatile? Think of the time it could save you. No need to wait while your PC runs payroll or quit your spreadsheet to answer questions about stock. ■ You need the timesaver — the remarkable Concurrent PC DOS from Digital Research. This lets you run up to four separate jobs simultaneously. You start a single program just as you do now. But when you want to, just touch a key and you get a fresh screen to work with... while your original program continues to run. ■ A two-user facility is ideal for people who communicate regularly to remote staff or offices. ■ Remember, each of your four programs is only a keystroke away. ■ And with the built-in window facility, you can keep track of all of your work on screen simply and easily. ■ Get a personal demonstration of Concurrent PC DOS at your local micro dealer, or complete the coupon below for more information.

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Your Computer is Number One

YOUR COMPUTER outsells any two of its competitors combined according to the respected computer industry newsletter *Systems User And Management*.

In its latest issue (No. 134), *Systems User* reports on the demise of *Australian Micro Computerworld*, which will close after its December issue, despite being number two to *Your Computer* in claimed sales.

The newsletter quotes *YC* sales at 24,000 copies, compared to 10,481 for *Micro*, and around 10,000 each for *Today's Computers* and *Australian Personal Computer*. Industry newspapers *Computerworld* and *Computer Weekly* are quoted at 7049 and 6138 copies respectively.

The announcement of *Australian Micro*'s closure comes just weeks before the release of the latest magazine sales figures by the Audit Bureau of Circulations, the only accepted measure of magazine sales in Australia.

Micro was the first magazine to follow *Your Computer*'s lead in having its sales audited. Therefore, the figures for the other magazines are from 'informed sources in the magazine distribution industry', according to *Systems User*.

Our own sources suggest these figures may be a little off the track in two cases — *Today's Computers* appears to be even further behind, while the *APC* figures should be higher. But as neither magazine is audited (*Today's* because it is too new to have been included, *APC* because its publisher has so far chosen not to submit to audit), accurate figures are impossible to obtain.

The Audit Bureau figures are an accepted industry standard, as sales are monitored for a six-month period and only the *average, paid* sales are reported. The average paid sale can be up to 10,000 copies below peak sales for one issue (especially if the publisher includes free copies in his circulation claim, a practice which is not allowed under the Audit Bureau rules).

Your Computer's current ABC audit figure of 24,000 is a publisher's statement — to reduce the significant cost involved in constant auditing, The Audit Bureau's normal practice is to use a publisher's statement in alternate audit periods. 'Cheating' is ruled out by the fact that the periods on either side are audited, and any discrepancy in the publisher's statement would be immediately obvious.

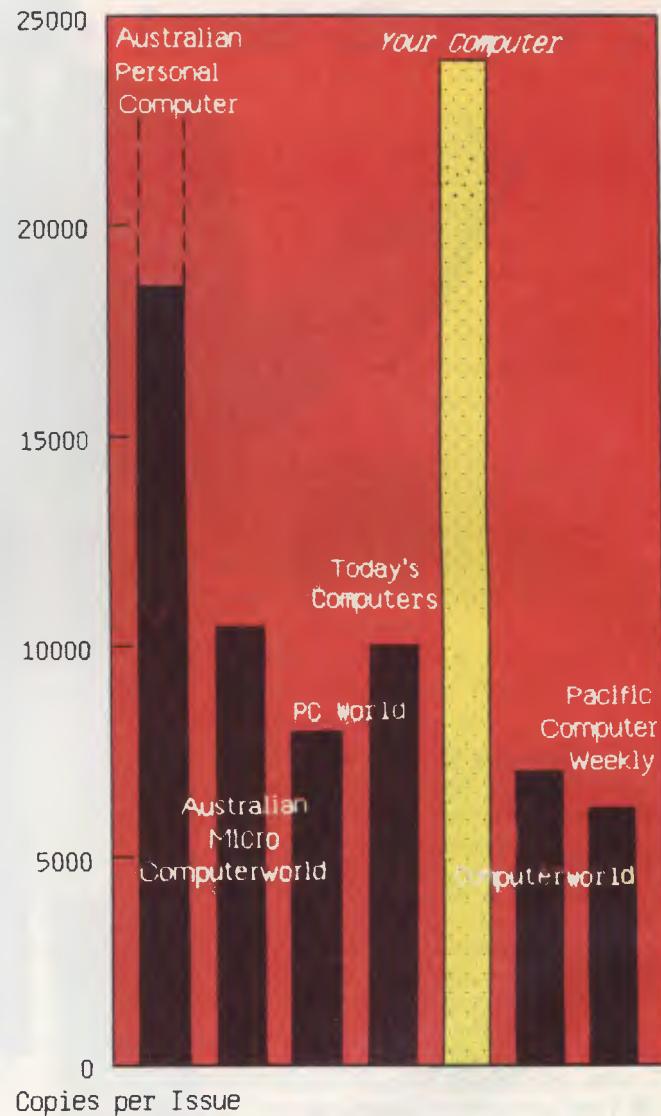
YC's previous audits were 15,500 (October 1982 to March 1983) and 19,790 (April to September 1983). Both were full audits. The current figure of 24,000 copies relates to the October 1983 to March 1984 period.

More Readers, Too

This is also the only computer magazine which has been prepared to submit itself to another industry standard measure — the Roy Morgan Research national survey of magazine readership.

The latest survey, for the period January-June 1984, shows a massive 164,000 people read *Your Computer* each month, an average of around seven readers per copy. This 'pass-on' rate is actually low for a special-interest magazine, which indicates our readers generally prefer to hang onto their copies.

For the statistically minded, we are currently preparing a full breakdown of the magazine's readership profile. However, here are a few points to emerge from our initial reading of the



Computer Title Circulations Australia, 1984

survey (it comprises 510 pages of tables and statistics, so it's not easy to zip through...):

First, *YC* has 137,000 male and 27,000 female readers, with 56 per cent of them under 35 and 44 per cent over 35. Of those, three times the workforce average fall into the top Professional/Manager occupation group and around half the magazine's readers earn over \$25,000 pa.

Compared to the general population, *YC* readers are less likely to be unemployed and more likely to buy a new car, to travel interstate and overseas, and to have an American Express card.

Around half the magazine's readers are graduates, are attending, or have attended university. Almost half — 75,000 people — are in the top (AB) socio economic level. More than 45,000 readers live in country areas; 117,000 live in the capital cities.



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Turning Eight Bits into Sixteen

WITH 16-BIT computers taking over the microcomputer market, many owners of eight-bit machines must decide whether to replace their units in order to be able to use most of the new software. Upgrading to a 16-bit machine may also entail abandoning old files, or going through a painful conversion process.

The CO16 Attached Resource processor is said to provide the power and memory addressing capability of a 16-bit microprocessor without disturbing the present eight-bit operation of Z80-based machines.

The CO16 may be attached to almost any micro with a Z80 processor running the CP/M 2.2 operating system. It comes with

256K of RAM (expandable to 512K) and a pre-installed 16-bit operating system. The operating system can be either CP/M 68K, with Digital Research's C compiler, for the 68000 processor, or MS-DOS 2.11 for the 8086. CP/M 86 is an optional extra for the 8086. The eight-bit system will act as an I/O handler for the 16-bit system, with no BIOS modifications required.

Three modes of operation are available using the CO16: the eight-bit system may be used exactly as it was before the co-processor was attached; the eight-bit system can use the memory on the CO16 as RAM disk; or any program may be executed which is compatible with the relevant 16-bit operat-

ing system.

The eight-bit and 16-bit CP/M data files are completely compatible, while the MS-DOS files on the CO16 can share physical mass storage devices with CP/M files. This is accomplished by storing MS-DOS files (and directory) in a CP/M file. A utility is included which allows MS-DOS 'data' to be extracted from such MS-DOS files and be placed in 'real' CP/M files, and vice versa.

Prices for the CO16 start at less than \$1000. More information may be obtained from: Computer Transition Systems, Section CO, Box 4553, Melbourne, 3001; (03) 537 2786. □

Goodbye Richard ...

YOUR COMPUTER is bidding farewell to advertising manager, Richard Pakalnis. Major expansion by the company which publishes *Your Computer*, Federal Publishing, has meant that Richard's talents are required elsewhere.

He will take over as administration manager of Federal, which now publishes more than 20 regular titles.

Richard has been with this magazine for two years and has had a vital role in its development as Australia's leading microcomputer monthly. He has been a delight to work with and will be missed by all of us here. We wish him all the best for his new project. □

Women Form

SWAT Group

FOR MANY women, working in the computer industry and other high technology areas can be an isolating and alienating experience. Often women occupy the lower strata of the industry, and those who climb the heights frequently find themselves the only females in an environment dominated by men.

A recently formed group, Sydney Women and Technology, aims to redress the balance in the computer industry, and to provide women with support and information.

Some of the group's aims are: to encourage women to learn about computing and its basic principles; to combat the isolation and discrimination some women experience working in the computer industry; to share skills with one another; to discuss the impact of new technology on women's lives and its effect on their work; and to look at the political implications of technology, including the development of a feminist interpretation and approach.

SWAT is open to all women. More information may be obtained from the group: Box 214, Wentworth Building, University of Sydney, 2006. □

Computers in the Nursery

"I WOULD like a plant that will grow about two metres high, has pink flowers in Spring and will grow in a shaded area of our garden". This is typical of the type of question people who work in nurseries hear every day. What's more, nurseries stock thousands of plants and the range in stock is often changing from week to week. Couple this with the fact that most nurseries depend upon a

large number of casual staff and you have a situation ideally suited to a microcomputer.

Garden Data is a database program which has been designed to meet the particular requirements of plant nurseries. Up to 1600 plants can be listed on a 13cm DSDD disk. Each plant record contains information on how to feed, prune and generally care for the plant, together with how to protect the

plant from disease.

Nursery customers can be provided with a short report giving a complete guide to the care of any plant they purchase. Other features of the program include the printing of plant labels and a list of up to five suppliers of each plant.

Garden Data has been designed in Australia by D4 Data, of PO Box 26, Ringwood, 3134; (03) 725 6637. □



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3Com Network Servers

EtherSeries networks provide disk sharing, printer sharing, and electronic mail. These functions are provided by network servers, which are specially designated computers with disks and printers that the other computers can use.

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NETWORK SOFTWARE



3Com EtherShare

The EtherShare software lets many personal computer users share the hard disk on a network server. The shared hard disk saves money and allows virtually all MS DOS software to be used with EtherShare.



3Com EtherPrint

EtherPrint lets many personal computer users share the printer's capability and cost via the network.



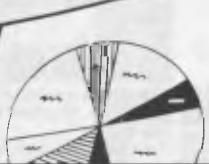
3Com EtherMail

EtherMail can be used to send messages and memos, even documents and files, to other personal computer users over the network. Judged the "Software Product of the Year" by *International Resource Development, Inc.*, EtherMail is powerful, yet easy to use electronic mail package.



3Com Remote EtherMail

Personal computers not connected locally need not be excluded from electronic mail. The Remote EtherMail Software runs on a modem-equipped personal computer and links it to the network by phone.



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Toshiba Printer Prices Cut

TOSHIBA AUSTRALIA has announced price cuts averaging 25 per cent on its range of P13XX printers. These dot matrix printers have 24-pin heads, which provide letter quality, draft and graphics output.

The top of the line P1351, a letter quality printer with a wide variety of fonts which can be

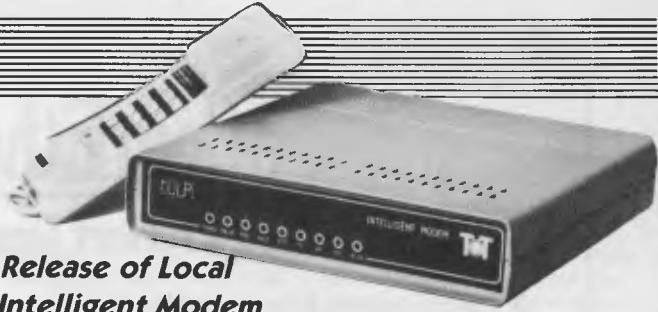
downloaded from diskette on an IBM PC or compatible computer, has been reduced from \$2920 to \$2240. The P1350 with two fonts is down from \$2455 to \$1988, and the P1340 80-column printer has been reduced from \$1450 to \$995. All prices exclude tax. □

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Release of Local Intelligent Modem

A HI-TECH workshop in Hornsby (NSW), Teletext Communication Technology, has produced what is claimed to be the first Australian-designed, fully automatic intelligent modem for the switched network.

Called Tulpi — an Aboriginal word for talking stick — it is a V21 and V23 direct-connect modem with an integrated telephone handset.

Tulpi has no switches or buttons — all commands are passed through its RS-232 port. The modem supports tone and pulse dialling and detects the presence of a dial tone before it starts dialling. It has a 'wait for dial tone' function to allow dialling through a PABX. Incoming calls can be answered either manually or automatically, and automatic disconnection occurs

if the carrier from the remote modem is lost. There is also a manual disconnect command.

An inbuilt 576 byte buffer allows the modem to operate at different baud rates between the line side (Telecom line) and the user side (RS-232 port). For example, when it is connected to a Videotex service, which uses 1200 baud with a 75 baud back channel, the modem allows the user side to operate any full duplex baud rate from 1200 to 19200 baud.

More than \$500,000 has gone into developing the modem, with a large part of this money being provided by the Federal Government's Industrial Research and Development Board. Tulpi will sell in Australia for about \$1150. More details may be obtained from Terry James, (02) 908 1777. □

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The professional wordprocessing programme for the Commodore 64 or Executive SX 64. Incorporates the powerful features for which this programme is renowned world-wide. "Wordcraft is a steal" — Y.C. **D-95.00**

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Briefly . . .

■ Hewlett-Packard has released 9 cm microfloppy disk drives for its entire range of personal computers. The double-sided, double-density disks provide 710K of formatted storage capacity, trebling the capacity of the single-sided version introduced in 1982. More information from John Delfereos at Hewlett-Packard: (03) 895 2895.

■ For those needing a simple means of switching between their letter quality and dot matrix printers, an Australian company



has designed Port Switch, which will accomplish the task with a press of a button. The switch is available in serial and parallel models for almost all popular microcomputers. It costs \$149.95. More information from: Kent Design, 27 Arthur Street, Caulfield North, 3161; (02) 509 8751.

■ Almost all software for Apple computers is copy-protected, preventing users from making backup copies. A newly released copy program, Essential Data Duplicator, lets users create backups of over 300 programs. EDD works by copying entire disks and is thus able to copy both single-load and multi disk access programs. It is distributed in Australia by Utilico: 83 Hall Street, Bondi Beach, 2026; (02) 30 2105.

■ Cromemco has released PCworks, developed by

Touchstone Software Corporation, for its new series of UNIX System V computer systems. PCworks provides an easy-to-use method of attaching IBM PCs and IBM-compatible microcomputers to the multi-user Cromemco System 100 and System 300. It is compatible with PC-DOS 2.0 or PC-compatible MS-DOS 2.0. For more information contact Insystems, (02) 439 3788 or (03) 690 2899.

■ A low-cost voltage regulator with optional line filters, which protects your computer system from power fluctuations, is being marketed by Electromark. The Matsunaga Voltage Regulator comes in a variety of models — the 350VA model costs \$141 (excluding tax), and the Murata filter, which intercepts power spikes, will be installed for an additional \$25. Electromark can be contacted on (02) 570 7287.



■ After one-and-a-half years of research and development, a team of programmers led by Phillip Mitchell (author of The Hobbit program) has produced a new adventure game, 'Sherlock Holmes'. The program has an 800-word vocabulary, and features extensive interaction between the user's character and the other characters which people the Victorian landscape. It is available on the Commodore 64 and Sinclair Spectrum, and costs \$39.95. More information from Sue Anderson on (03) 699 6155. □

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Trace Your Tree on an Apple

GENEALOGISTS WILL welcome a new program from Projectree called Family Tree, which has been written locally by Wendy Mesler, for the Apple II. Jan Worthington, a member of the Association of Professional Genealogists, reports that the program incorporates a number of features not frequently found in other genealogy programs.

The software is supplied with a manual and blank forms for collecting family information. On the disk is 'Example Family', an imaginary family which allows the user to explore the limitations and capabilities of the package before committing real genealogical data to disk.

The program is menu-driven, with screen-prompts throughout to guide the user. Nine hundred individuals can be

stored on one floppy disk. Historical notes can also be included in each individual's record; these can be unlimited in amount and printed in two different formats, described as 'narrative' and 'who's who'.

The printing option offers a wide variety of formats, including Family Group Sheets and Descent Charts which include all members of a family including brothers, sisters, uncles and aunts. Birthday and Christmas lists are an additional way of presenting data.

Family Tree requires a minimum of 48K memory and preferably two floppy disks (although it will run with one). It is due for release this month and will cost approximately \$70. For more information contact Wendy Mesley, on (02) 411 7619. □

French Gigadisc Available Here

RUNNING OUT of space on your hard disk? Perhaps you're ready for the new Gigadisc solid-state laser cassette. Each single-sided cassette will hold 1000 megabytes (one gigabyte) of data, which may be accessed sequentially, randomly or by an optimised random method. The Gigadisc may be interfaced to almost any computer via the Small Computer System Interface.

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('bubbling') of the metallic film. This ensures that the data, once recorded, cannot be altered and maintains a high degree of integrity over a normal life period of ten years.

Developed by French company Thomson-CSF and distributed in Australia by Pulsar Electronics, the basic Gigadisc model will retail for approximately \$20,000, with extra two-gigabyte cassettes costing \$500. For more information contact: Mr Phillip Delacretaz, Pulsar Electronics, Catalina Drive, Tullamarine, 3043; (03) 429 2977. □



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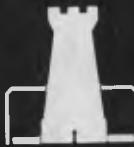
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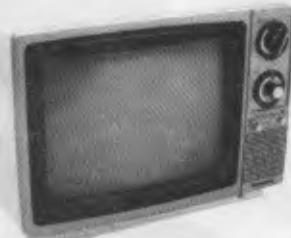
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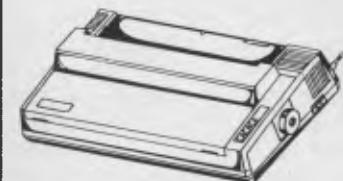
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When we look back at 1984, there seems little doubt it will be remembered as the year of integrated software – the year in which we first saw giant 'does-everything' packages incorporating spreadsheet, database, word processor and kitchen sink. Les Bell examines the trends and the packages.

SOFTWARE SHOOTOUT

THE TERM 'Integrated Software' really has no easily defined meaning; there are no criteria which an integrated software package has to match. In fact, it's an advertising term; a cynical viewer might describe an integrated software package as one that sells better when it's described that way.

Before proceeding, therefore, it might be a good idea to get some definitions and terms down on paper, so we know what we're talking about. And a good way to do that is to examine the history of integrated software and the ideas that have shaped its development.

We know integrated software is intended for executive decision support functions, which got their start on personal computers with the arrival of VisiCalc in 1979. VisiCalc was the first popular spreadsheet calculator, but it suffered from one major problem: its isolation from the sources and sinks of corporate data.

The sales figures keyed into VisiCalc budgets had to come from somewhere – usually the company's sales database on another computer. The figures were printed out and then re-entered by hand, a tedious process that detracts somewhat from the obvious advantages of using the package.

The output from VisiCalc was a budget sheet, a huge table of figures with the bottom line generally being net profit. Such sheets are often next to unreadable, since business exec-

utives seem to work in a semi-visual way. We can all understand a wall graph which goes from top left to bottom right; we know it represents a problem!

Soon after the release of VisiCalc, therefore, software companies started to come up with graphics programs which could read in spreadsheet data and graph it on the display of the Apple II. Software Arts, which wrote VisiCalc, assisted in this process by announcing the DIF (Data Interchange Format) file format, which specifies the contents of files used for data transfer.

At the same time, VisiCorp was working on a companion program called VisiTrend/Plot. This could pick up data from VisiCalc and perform simple statistical analysis and graphing on it. However, it meant running two separate programs, on two separate disks (because of copy protection), which was inconvenient, to say the least – particularly if you decided a graph didn't look right and had to return to the spreadsheet for further work.

The author of VisiTrend/Plot felt a better solution would be to build the graphics into the spreadsheet program itself, but he could not interest VisiCorp in this idea. Instead, Mitch Kapor decided to found his own company to develop such a product. The company was Lotus Development Corp, and the product, Lotus 1-2-3, was a runaway success.

1-2-3 was successful for several

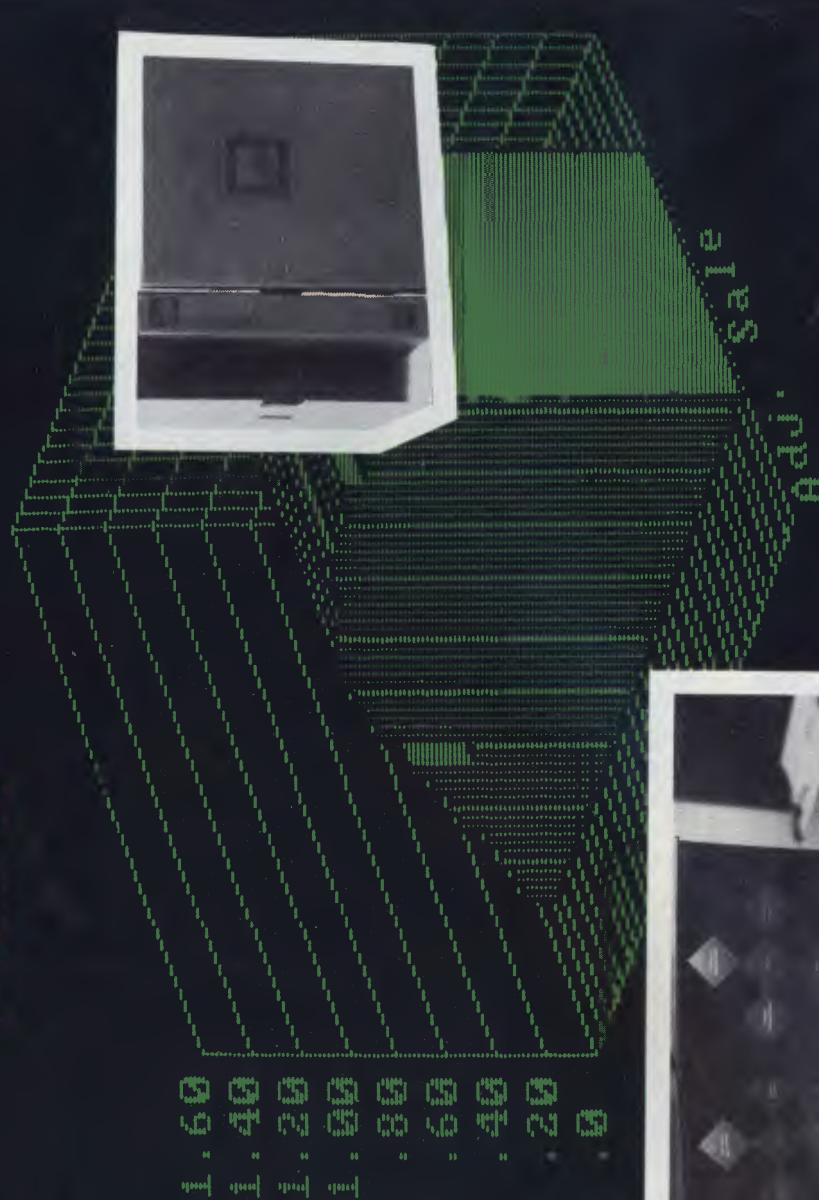
reasons; it was a high-performance spreadsheet which took advantage of the hardware features of the IBM PC; its integrated graphics were simple and quick to use; and its database manipulation commands enabled sorting and selection of, say, sales figures by division or salesman. An aggressive advertising and public relations campaign helped as well, of course, but there is no doubt that the product's magic made converts of even the most sceptical.

At the same time as Lotus 1-2-3 hit the market – in fact, just before – a package called Context MBA offered even more functions: spreadsheet, graphics, database, word processing and communications. Context MBA was the first of the 'third generation' integrated packages, but it failed in the marketplace for two simple reasons: it was too slow and it could not access data in conventional PC DOS files. Both reasons could be attributed to MBA's UCSD p-system background. Nonetheless, MBA showed the way to the future.

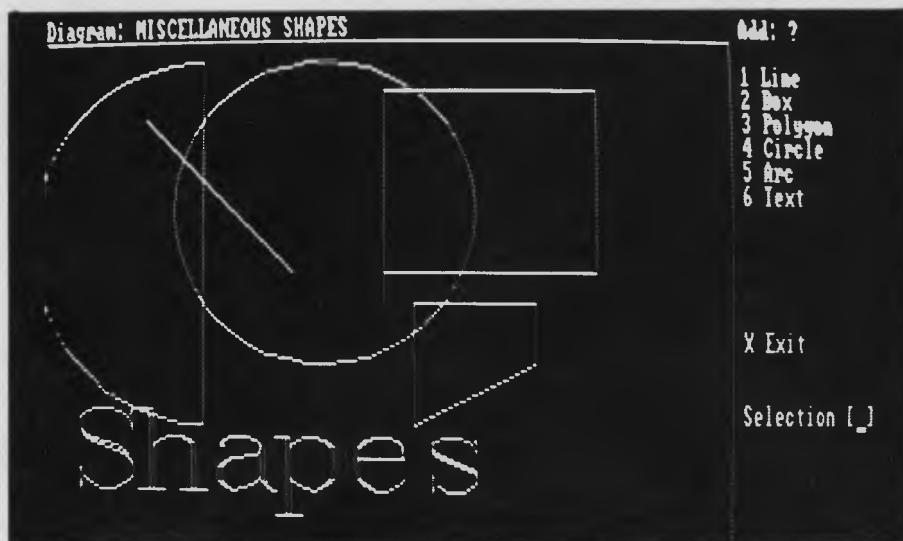
In the last few months, a number of packages have been released which claim to be 'integrated'; in fact, there are currently over 20 genuine integrated software packages on the market in the US, though most have not yet made their way across here. There are many more which claim some degree of integration, though they all suffer some limitations.

The definition of integrated software ►

X 1000000



SOFTWARE SHOOTOUT



Aura is the simplest to use of our review packages. The graphics capabilities shown here, for example, allow the user to draw basic shapes 'freehand', rather than having to manipulate the actual data to be graphed.

I shall use here is that such packages possess two key characteristics:

- The ability to transfer data between application modules
- A common command structure for each application menu

The ability to transfer data is at the core of the integrated software packages; one should be able to transfer data from, say, a sales database, to a budget spreadsheet without any re-keying of data. Given this ability, an integrated package may be justifiable for the reduced data entry time alone.

The common command structure is a major benefit in reducing learning time and reducing confusion. Pity the poor user with dBase and WordStar, for example, on finding that $\uparrow E$ moves the cursor up in WordStar, while in dBase it's the <up-arrow> key. Programmable keyboards help in some cases, but only serve to confuse in others. And what about simple commands for exiting from programs or modules? Just thinking of some of the programs on my systems alone, there's EXIT, QUIT, RETCPM, SYSTEM, BYE, $\uparrow KX$, Q, X, E, DOS, END, 9, 0, and a whole lot more. Wouldn't it be nice if all your programs behaved the same way?

Integrated software, where all the sub-systems are supplied by one software company (or even one author), provides the opportunity to

arrange just that. It makes learning the systems so much simpler.

Many integrated software packages may also supply some kind of windowing or screen formatting, which allows data from different application modules to be displayed simultaneously. This can simplify transfer of data between modules and make the system easier to work with on complex projects.

Integrated software typically handles at least four functions: spreadsheet, database, graphics and word processing. Other functions may also be supported, such as communications, time/calendar management and others.

Spreadsheet Calculator

The spreadsheet calculator is the prime function for financial executives, and is also significant for general management, production and marketing people, and others. Spreadsheets have revolutionised budgeting; virtually no-one uses paper and calculator today. They are also used for a variety of other purposes including 'what-if' analysis, simple accounting applications and all kinds of functions for which their original creators never intended them.

In the integrated package, the spreadsheet is the primary 'number-cruncher'. If any kind of numerical analysis is required, this is how it must be done. If your problems are

not amenable to this kind of solution, you'll have to investigate alternatives.

Database

There are databases and there are databases. Executives have traditionally used single-file list managers which have crude sorting and reporting functions, while, further up-market, many PC users have adopted dBase II and similar products which are fully programmable and can be used to write turn-key applications.

It is interesting to note that executives have gradually moved to the more powerful packages, learning to cope with the more complex command structures as the penalty for increased performance. The database managers in integrated packages vary considerably in their approaches; some are very simple-minded, while others are remarkably sophisticated.

Many middle managers are database-oriented: examples would be sales managers tracking prospects, purchasing officers, quality control people and so on. These people primarily need to perform statistical processing of the database, produce mailing labels, merge names and addresses into letters and so on.

Graphics

The graphics module is generally closely linked to the spreadsheet, as you usually just want to graph the bottom line to identify seasonal trends, perform extrapolation by eye, and similar tasks.

Word Processing

Many senior executives — or more precisely their personal assistants and staff — are strongly text oriented. While a picture, or a graph, is often worth a thousand words, there are times when only the words will do. You can't describe a marketing strategy with graphs or a spreadsheet.

In any case, those executives who are spreadsheet or database oriented still have to produce memos and reports on their work. They may not type them themselves, but whoever does will be glad of the ability to include spreadsheet and database material into the report without retying. Many people 'think on paper', and a good word processing program can be surprisingly helpful in this activity, providing the ability to produce clean drafts at the push of a few buttons.

Additional Functions

In addition to these capabilities, many packages offer extra functions. These

may not seem important at first, but they're the kind of things of which you later say 'How did I ever manage without ... ?'

Communications

The ability to communicate is essential today. Corporate users will not tolerate a personal computer which cannot communicate with the company mainframe; all users want the ability to transfer documents between offices by modem and telephone line, and many users are discovering the advantages of being able to capture data from public databases.

Most packages implement asynchronous communications, that is, the simple low-speed kind which you use with modems on the public switched telephone network. This allows dial-up access of remote systems, or access to company minicomputers on tied lines. Many packages also implement some kind of file transfer protocol, most commonly Christensen protocol, as used by bulletin boards and public domain software packages. This allows non-text files to be sent, such as databases, spreadsheets and graphs.

Some packages (and this just has to be a major trend) also implement synchronous and bisync protocols, as used by IBM mainframe terminal cluster controllers. These allow mainframe communications sessions to take place from within the package, and may also support file transfer, allowing the mainframe to be used as a 'mailbox'.

Time Management

The most valuable resource an executive has is his time, and it is surprising that, while we have tools to manage other corporate resources more effectively, time management programs have not become more popular. Apart from the fact that no-one seems to have time to use them, they offer a number of benefits.

Only one of the packages reviewed offers a time management facility, perhaps because such programs are more commonly associated with multi-user minicomputer office automation systems, such as DEC's All-In-One and DG's Comprehensive Electronic Office.

The time management program can track appointments for several people, schedule meetings at mutually convenient times, print diary pages and generally assist a personal assistant to keep track of what several people are doing. Several other uses spring to mind - for example, job planning and resource

scheduling, or keeping track of costs on people-intensive projects such as software development.

Outlining

The idea of 'top-down design' is quite familiar to software developers, who routinely start with a vague specification of a program and then segment it into progressively more specific modules. However, many knowledge workers conceptualise and plan in a very similar way. Take writing a speech, for example. Good public speakers always start with an outline which follows a standard formula:

- Introduction/establish credentials
- Maybe an ice-breaker joke or two
- Here's what I'm going to talk to you about - main heading and three topics
- Here's topic number one
- Here's topic number two
- Topic number three
- I just told you about one, two and three
- Call to action

A methodical approach to writing such a speech is to write each section heading on a five by seven file card, and then start making notes on the cards. When one gets full, replace it with separate cards for its sub-topics.

That's how the outlining processor in Framework works, and I think we can expect other developers to come up with similar approaches.

Other Facilities

Future integrated software products can be expected to have additional facilities and extensions. For example, Framework has a built-in language called FRED (Frame Editor) which can be used to write applications for the system, and which is considerably more powerful than the macro programmability seen in earlier products. Framework can also run DOS commands within a frame, and copy the output of a program into its frames.

With the aid of these facilities, it is possible to push integrated products beyond the application areas envisaged by either first-time users, or indeed, the creators of the programs themselves. Lotus 1-2-3, for example, was initially viewed as a management tool for financial executives only, but some sophisticated programs have been written in it for what are essentially clerical tasks.

Advantages and Disadvantages of Integrated Software

The major advantage of integrated software is the elimination of rekeying



data when switching between applications. But since you never did it anyway, the real benefit is that it makes it possible for you to do things that were not possible before: maintain sales information in a database, for example, and then pull summarised data into a spreadsheet for further analysis, or provide spreadsheet data and graphs as part of a report to senior management.

The results should be: improved quality of information and hence management decisions, competitive advantage over other companies, a significant increase in executive productivity, and the ability to explore new ideas.

Integrated software should also reduce the training time for an executive in learning the software. As mentioned above, executive time is expensive, and it is difficult to devote time to reading manuals when there is work to be done. Learning one integrated package should be quicker than learning a separate word processor, database, spreadsheet and so on.

Integrated software can be cheaper to buy than separate software packages: add up the cost of a separate word processor, spreadsheet, database manager and graphics, and already it's more than many integrated packages. Plus, you have the reassurance that since all the software came from one publisher, you have someone to turn to when you get into difficulties with interactions between modules. Suppose, for instance, you are trying to read data from Brand A database into Brand B spreadsheet, is either software publisher obliged to provide assistance? You're likely to receive replies like 'It's not our database, it writes standard files, it's the Brand B spreadsheet' and 'Our spreadsheet is designed to read files in such-and-such format, and we can't be held responsible if Brand A database doesn't produce them'. This problem shouldn't happen with integrated packages.

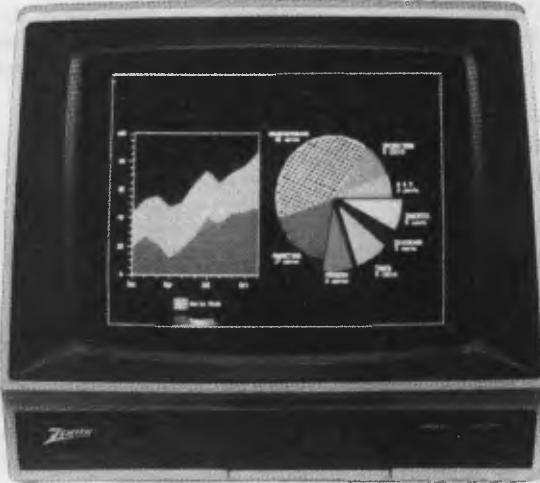
What are the disadvantages? Writing an integrated package means writing a spreadsheet program, a graphics program, a database program, a word processor and other programs, plus the code to tie them all together, and that's a lot of work. The chances are, that unless the software company

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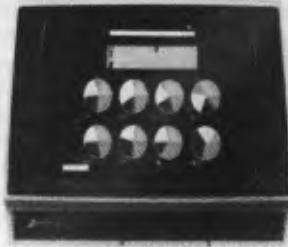
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ZVM-133: 80 column colour display.

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is well funded and not in a rush to bring the product to market, some compromises will have to be made.

You may find, for example, that while the spreadsheet in a particular product meets your needs exactly, the word processor or database is just unworkable for your situation – or vice versa.

Integrated software packages are, necessarily, bigger than spreadsheet or other single-function programs. This means that spreadsheet models which come close to utilising the maximum memory capacity of a PC will not run under the integrated packages. For dedicated builders of large models, either dedicated spreadsheet or financial modelling programs would be a better choice – or, we can expect next year to see integrated packages running on next generation machines like the IBM PC AT, and able to take advantage of the much larger memory space of such machines.

If you primarily need a spreadsheet, and the other functions are of little use to you, but 'nice to have', you may find, because of the tutorial nature of the manuals for these packages, that you have to wade through a lot of material not immediately relevant to your needs, simply to learn how to operate the spreadsheet. The information on saving files, for example, may be buried in the section on the word processor. This kind of thing will lengthen learning time.

The Products Reviewed

In this article, we look at four different integrated software packages, each with a different approach to integration.

Symphony

This is the new product from Lotus Development Corporation, and is, in some senses, a successor to the popular 1-2-3. Its spreadsheet is similar to 1-2-3's, and experienced 1-2-3 users should be able to use Symphony with no difficulty – the menu selection scheme remains the same, although some of the selections on the menus have changed.

Symphony still has a strong spreadsheet orientation, although it contains word processing, communications and window management facilities which were not seen in 1-2-3, and has beefed up 1-2-3's database management facilities considerably.

Framework

Framework is being marketed by Ashton-Tate (of dBase II fame),

although it was developed by Forefront Corp. The design of framework revolves around frames, which are windows containing text, graphics, database or spreadsheet information. There seems to be no particular orientation in Framework, although it probably has a leaning to verbal thinkers rather than spreadsheet hot-shots.

Open Access

Software Products International's Open Access ties together six functions: word processing, database management, spreadsheet, graphics, time management and communications. Although it looks like it uses a windowing technique, the windows are in fact fixed in place, and it is not possible to display two types of data simultaneously.

Open Access is designed to work in less memory than the other programs, and so makes more use of disk storage, both to load overlays and also to temporarily store data it is working on. This means that on occasions it is slower than other programs, but the trade-off may be well worthwhile.

Open Access seems to have no particular leanings to text or figures work. However, we did find that its user interface was the simplest of those tested.

Aura

Aura provides five major functions: database management, spreadsheet, graphics and word processing, together with system maintenance functions. Each of the applications modules could be considered as a standalone; there's no need to learn them all at once. On the other hand, Aura has extremely powerful linkages between the applications, so that updates in one area will be reflected right through the linked system.

The system is menu-driven, with a user interface which is reminiscent of Multiplan, and is very easy to use.

Other Forms of Integration

There are other ways of achieving integration between applications. Most probably the way this will be achieved in the future is through the operating system providing facilities for running multiple programs concurrently, with multiple windows on-screen showing what's happening. The operating system can also provide facilities for reformatting data which is being transferred between applications.

The Apple Lisa, for example, already provides this facility. Its operating system is multi-tasking, allowing several programs to execute at the same time. Its display drivers

SOFTWARE SHOOTOUT

allow 22 windows to be open on the screen at the same time, and the screen has sufficient resolution to permit this. Finally, its applications programs, though separate, are designed to permit cut-and-paste transfer of data.

After trying all the integrated packages discussed, we still prefer the Lisa user interface as the most intuitive and simple to use. We developed The Test (see box) using the Lisa, and found it the easiest to work with – largely because of the mouse. Although there has been considerable debate over the advantages of mice, we found the mouse considerably faster to use for menu selection than cursor keys *a la* Framework and Symphony.

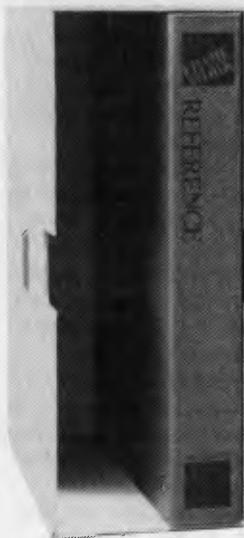
A similar facility for the IBM PC is reputed to be on the way in the form of Microsoft Windows, but it is now well over a year since Microsoft announced this product and we still have not seen it. In the meantime, IBM has developed TopView, an add-on for the IBM PC which supports multi-tasking and windowing, and which is now with software developers who are working on applications for it.

DesQ, another windowing package, from Quarterdeck Office Systems, has now made it to market. Although it does not provide multi-tasking capability, it at least allows several standard PC DOS applications to be co-resident, with the ability to switch between them and to cut and paste text between windows. It can be mouse driven as an option, and lets you continue working with your favourite word processor.

And of course, there's Digital Research's Concurrent DOS, which supports multi-tasking and windowing of existing CP/M and DOS applications, and has the facility for applications to transfer data between windows, although there is no way for the user to do it yet. Sometime next year (or the year after) DRI is expected to release a new operating system for the 80386, 68020 and WE32000 microprocessors. Codenamed Otter, this multi-user, multi-tasking OS will have the ability to run UNIX, DOS and CP/M applications in windows with full cut and paste integration.

That's the future. For now, the packages reviewed here will provide an added fillip for your tired PC. □

Framework may well be the most integrated of the integrated packages – it's an all-rounder rather than being biased to one of its work areas. And, says Les Bell, it is the sort of open-ended product that will encourage people to continually find new ways to use it.



FRAMEWORK FOR SUCCESS



MOST OF our readers will doubtless be aware of the name of Ashton-Tate, primarily for its dBase II and dBase III database management systems. However, Ashton-Tate has a number of other products in the financial management area, and its latest product, Framework, extends its activities into integrated software.

Framework was written by Forefront Corporation, which is also providing some support for the product in the form of books and manuals. Ashton-Tate is the packager and marketer of the product.

Framework is supplied in a large slip-case containing two manuals – one tutorial and one reference. Bound into the manuals are sleeves for the five floppy disks which carry the software, and there is also a card carrying three keyboard overlays – one of which is to suit IBM-compatible keyboards.

Framework has five distinct functions, plus supporting capabilities. The package is generally based around the word processing function, and therefore is best suited to those who are word-oriented – who have to produce reports, and so on. The spreadsheet calculator, database manager, graphics and communications functions are, in a sense, subservient to the goal of producing some kind of written text.

This is most clearly reflected in Framework's outline processor, which formalises the technique I long ago worked out for writing with a word processor. For example, my outline for this article was typed in before the article itself, and as I write I am simply filling in the gaps under the items:

- History
- Capabilities – wp, ss, graph, database, comms, outlining, FRED (Framework Editor)
- The frames concept
- Outlining
- User Interface
- Word Processor
- Spreadsheet
- Database
- Graphics
- Communications – MITE
- FRED
- The Test
- Summary

Right now, in case you're wondering, we're in the 'Capabilities' section.

The outline processor allows the user to enter the topics he wants to cover in an outline frame, which can, in turn, contain other frames, each of which can contain other frames or text, spreadsheet, graphics, database or whatever. This allows the user to create a hierarchy of frames, containing, at the bottom level, the data the user

is working on, and at higher levels, containing frames.

Frames can be thought of as windows, which can be resized and relocated on the screen in a manner rather similar to the Apple Macintosh and Lisa windows.

However, the conventional wisdom is that windows cannot contain other windows; they can only be subdivided into panes which give alternative views of the same document. In Framework, an outline frame can contain other frames (up to 32,768 of them) which can in turn be outline frames or text, spreadsheet, database or graphics frames. This helps the user to structure his work with the package in the most appropriate way.

The Framework user interface is surprisingly closely modelled on that of the Lisa and Xerox Star workstations. In this system, a menu bar at the top of the screen presents major menu choices, which, when selected, drop a 'blind' which shows sub-selections. In the Lisa, this is done with the aid of a mouse, while in Framework, since a mouse is not available, the cursor movement keys are used instead.

To get to the main menu bar, you strike the 'Ins' key, and the current main selection drops its menu blind. By using the arrow keys, you can now select the main menu choice and subselection desired, finally pressing the return key to accept that choice. This scheme works well, if somewhat slower than the mouse-driven version.

Also like the Lisa, Framework has a desktop. When the program starts, there is usually nothing on the desktop except the small boxes which represent the disk drives. By placing the cursor on top of one of these (it won't go anywhere else in the meantime) you can select it, and by pressing return, produce a disk directory on the desktop.

The directory is, of course, in a frame, and now by pressing the numeric keypad plus (+) key, you can move down one level into that frame. Now the up and down arrow keys select individual files on the disk, and by pressing return over one of the files, you can load it into the system.

Word Processor

The Framework word processor is not quite in the 'WYSIWYG' (what you see is what you get) idiom, relying heavily instead on print-time text formatting. A tremendous selection of commands is available, including centred headers, footers, commands to change margins and page formatting

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and even multi-line headers. The Framework word processing program could almost tempt me away from WordStar!

A variety of type styles is available, and all are displayed correctly on the screen *a la* Microsoft Word and Lisa. These include bold, italics and underlined – but of course, these will only print correctly on the IBM PC dot matrix printer. Text can be flush left or right, or centred, and the margins are of course variable. Text insertion is on as a default, but can be switched off from one of the menus.

An option allows characters which are normally invisible – carriage returns, tabs, and so on – to be made visible for more accurate editing.

Block moving and copying is extremely easy, using the Extend, Select, Move and Copy keys, which are on the PC function key template. This is, of course, how the spreadsheet replication function works.

Spreadsheet

The default spreadsheet size is 14 rows by 14 columns, although this can be altered at creation time, and it is also possible to extend spreadsheets after they have been created. Columns default to seven characters wide, although this also is variable.

The spreadsheet boasts the usual set of functions, including percentage, exponentials, and so on.

In fact, the spreadsheet makes use of the functions provided by the FRED (Framework Editor) language, giving a wider set of functions than is usual, including – for financial analysis – future value, present value, payment, net present value, internal rate of return and modified internal rate of return.

Other functions include a wide range of scientific functions and date calculations.

Database

The database facilities in Framework are conceptually similar to those of dBase II, but the implementation is quite different in detail. The major difference is that, unlike dBase II, which only brings one record into memory at a time and can therefore deal with databases much larger than memory, Framework requires the entire database to fit into memory at one time.

Like Framework spreadsheets, the database files are predefined in size at the time of creation, but can later be extended. Also like the spreadsheet, a database can contain formulas.

Databases can be sorted on multiple keys, a process that is quite fast because the entire database is in memory. A filter command allows you to extract records which meet specific criteria.

Databases can be copied into spreadsheets very simply; the system simply copies across the values from the database, not any formulas. Framework can also access dBase II databases.

Graphics

Graphs may be drawn directly from spreadsheets or databases, and may be of six different kinds: bar, stacked bar, pie chart, line, scattergram and X-Y graph. Data to be graphed is marked using the Extend Select command, and then Draw New Graph is selected from the graphs menu – it's as simple as that. Databases can also be graphed using the same technique.

Additional data sets can be added using the 'Add to Existing Graph' selection, and you can over-ride the defaults selected by the program to set your own scaling and end-values. Other options allow labelling of the axes, and even the explosion of pie-chart slices.

Graphs appear first in a frame, but this can be expanded, using the 'Zoom' key, to fill the screen and, as for other frames, you can drag the frame around the screen and resize it.

Communications

The communications facility of Framework is actually a separate program called MITE, from Mycroft Laboratories. MITE has been on the market in various versions for several years and is thoroughly tested and reliable.

MITE provides facilities for controlling autodial modems which are compatible with the Hayes Smartmodem (the only such modem in Australia is the new DataNetComm PC modem), and when invoked from Framework it first displays a menu of possible activities – ringing The Source, Joe's PC, and so on.

Each of these is associated with a MITE parameter file, which contains details of the number to dial, the baud rate, protocol, and any other necessary information. Everything then happens automatically.

MITE supports a number of protocols, but the most important of these are the standard 'glass teletype' comms with no protocol at all, and the Christensen protocol, which allows file transfer with handshaking and

SOFTWARE SHOOTOUT

error correction.

We found no difficulty in transferring files between our IBM PC and Brutus, our S-100 communications machine, which was running YAM. However, one strange 'feature' of MITE is its use of Control-J as the terminal mode exit character, preventing the user from sending a linefeed to the remote machine.

FRED Was Here . . .

Framework is unique among the packages reviewed, in that it includes a programming language called FRED (Framework Editor). It's not clear just how much of Framework is itself written in FRED (not a lot, I suspect), and there is not much information given in the manuals on programming in FRED. However, FRED is extremely rich in functions, which work basically in the same way as the spreadsheet functions. FRED is able to pick data out of frames, referring to frames, which may be nested, in much the same way as DOS uses pathnames.

In fact, all the formatting functions used in the word processor, the spreadsheet functions, string-handling functions – all are part of the FRED language.

More Power Lurks Within

We haven't really begun to touch on some of the more advanced functions of Framework. For example, calculations inside spreadsheets, databases or FRED programs can refer to the contents of other frames, thus linking together frames in a very powerful way. Nor have we covered the keyboard macro facility, which uses the ALT key to access stored sequences of keystrokes.

The impression we get is that Framework is a very open-ended product. That is, it is capable of doing a lot of things its designers did not have in mind when they created it. This should assure it of a long life and of appeal in a wider marketplace than many other products.

Framework seems to have no particular bias to one work orientation or another; that is, it's not a spreadsheet with added-on features, nor is it a database with a spreadsheet tacked on. Overall, it seems to be fairly strong in both data management and word processing, and is a strong all-round performer.

THE INTEGRATOR, INTEGRATED

THE IMMEDIATE impression one receives of Symphony is of considerable complexity. A common complaint from users — even those who are experienced with 1-2-3 — is that their first day with the package is a nightmare. Of all the packages, this one has the steepest learning curve. However, once over this hurdle, the going gets easier.

Symphony has a distinct spreadsheet orientation. Its word processor, database and other functions are simply different ways of looking at, and manipulating, the underlying spreadsheet. For this reason, the primary group of users for Symphony will be financial managers and accountants. They are the people for whom it has the strongest appeal.

Spreadsheet

The Symphony spreadsheet is basically the same one as is used in 1-2-3. It has a number of enhancements, but the menu structure is basically similar. Many things have moved around in the menu, but they're not difficult to find. Although officially you now have to start menu commands by pressing the menu key (F10), striking slash (/) will still work — a concession to users with habits acquired from 1-2-3.

In fact, there are several menus in Symphony. Each window type has a different command menu, and there are five corresponding types of work environment: SHEET, DOC, GRAPH, FORM and COMM. These are all accessible from the Services menu (F9). Windows can be resized, moved, split into panes, brought to the front of the stack and generally manipulated. In particular, they can be retyped.

An important corollary of the way Symphony works is that no complex data conversions are required when switching between work environments — you are still dealing with a spreadsheet.

Like 1-2-3, Symphony allows you to create named ranges of cells, but this concept is even more important than before, particularly when using the spreadsheet in database mode.

The Symphony spreadsheet is very nice to use, with the same excellent concepts that made 1-2-3 so popular. It is macro-programmable, though the Symphony command language is quite different from 1-2-3's — and more sophisticated.

Graphics

Symphony's graphics are very much in the 1-2-3 mould. From the spreadsheet it is possible to issue a graphics command to plot a set of figures in very much the same way as 1-2-3, but there are more options and better control of labelling, scaling and so on. It is possible to pick up labels from the spreadsheet, for example, by prefixing the co-ordinates with a backslash.

Graphs appear in a separate window, which can be left at its original small size or blown up to fill the screen.

Word Processing

The Symphony word processor actually allows you to treat the underlying spreadsheet as a piece of paper. You are still looking at the spreadsheet, but the co-ordinate markers around the edge of the window disappear, to be replaced by line numbers and the tab and margin markers at the top of the window.

The word processor actually refers to locations on the screen by the line and column number co-ordinates, and block copying and moving are performed in exactly the same way as on the spreadsheet: select copy from the menu and move to the beginning of the copy block, anchor the start point with the tab key, move to the end of the block and hit return, then move to the target area and hit return again. It's a simple,

straightforward scheme which works well.

Print formatting is done by means of format lines which can be edited using menu options. These allow control over margins, tabs and justification, and provide considerable versatility of layout.

Movement in the word processor is quite quick, using some clever schemes based on the PC keyboard numeric pad to allow quick moves to the ends of sentences, paragraphs and so on.

Print enhancements are performed using the 'compose' key to mark the start and end of enhanced text. Print styles available include bold face, italic, underlined and so on.

Database

The Symphony database closely follows the 1-2-3 model: that is, it treats an area of the spreadsheet as a set of records and provides a set of database commands to sort, extract and generally manipulate the database.

Symphony adds a new level of functionality, however, in the ability to create and use screen forms, rather like those of dBase II and other database managers. As you would expect from a spreadsheet program, the definitions of these forms are stored in tables in an area of the spreadsheet, and this requires some expansion of the spreadsheet concept to make it work. In fact, there's something of a conceptual leap involved in imagining the flow of information between the screen, the entry range and the database range.

The screen is defined in a database range, which contains the names, types and values of each field, as well as edit/validation rules, default values and formulas for derived fields. When you fill in a form, the current record values are temporarily stored in the entry range, validated and processed against the rules in the entry range, and then transferred to



Probably the best-known of the packages examined in this survey of integrated software packages is Symphony from Lotus Development Corp, the successor to Lotus 1-2-3. In fact, Symphony gives the distinct impression of being an expanded version of 1-2-3, particularly since it is to a large extent organised in and works the same way. Will it have the same runaway success as 1-2-3? Les Bell reports.

the database range.

To further confuse you, you can also have a criteria range, which is used to specify criteria (such as age > 30 or days-owing > 90) used to select particular records when browsing through the database. You can also extract records from the database and transfer them to an output range and sort the database on up to three key fields.

I would have to say that this kind of database is quite different from databases as we are used to them on mainframes or even in micro packages like dBase. In fact, it is so different as to almost require a new term: the term database is now sufficiently imprecise as to be almost devoid of meaning.

For example, a Symphony database is not stored in files which are opened and processed on disk; instead, the whole database is in memory at one time, which considerably restricts its size (particularly since Symphony takes up so much space itself). Symphony's database is quite different in its operation from programs like dBase II, in that while it is quite powerful and versatile, it is still a spreadsheet stretched out of shape

with the addition of some very ingenious commands.

Communications

The Symphony communications module is able to emulate a standard 'glass teletype' and is also able to handle file transfer using the Christensen protocol. By using a special menu selection, the user can initiate automatic log-in sequences, with programmable delay times, to handle all the messy and time-consuming dialogue that takes place with remote systems when you first log into them.

Symphony can also be left in unattended auto-answer mode, though we haven't been able to figure out yet exactly what it can do after answering the phone.

User Interface

The Symphony user interface is based on menus; the beauty of the Lotus menu scheme is that it is unobtrusive and fast to use. There is a menu for each work environment, plus the Services menu, but a detailed knowledge of each is not necessary.

Symphony also makes heavy use of the numeric pad keys and those

around it — particularly in conjunction with the control and alt keys, and this means there is quite a lot to remember when using it — see our comments about the overall complexity of the package below.

An important point about Symphony is that all activity takes place on a single worksheet in memory, which is saved and reloaded as a single entity. This means that 'de-integrating' parts of a task — pulling out a database, say, is not as easy as with the other packages. On the other hand, it means that context switching is much easier, and that the user interface is more consistent, if more complex.

Installation

Symphony requires the user to install various device drivers on the program disk before using it, for communications devices, plotters, printers, colour screen and so on. This process is far from simple and is not well documented — indeed, the whole section about backing up the Symphony disks is a bit vague, presumably for fear of letting slip anything about the copy protection scheme used. In any case, we found the installation procedure confusing, in part because of poor documentation and partly because of obscure terminology.

Apart from this, the documentation is pretty well excellent. There are two main manuals: the How-To and Reference Manuals, together with an Introduction book, a Glossary and a Quick Reference guide. They are all illustrated with example screens and short tutorials, and the system also comes with a disk-based tutorial which gives a good feel for the system's operation.

Overall, we found that Symphony is the largest and most complex of the packages evaluated, and it definitely has the steepest learning curve. Experienced 1-2-3 users will probably make the transition without too much trouble, but for the newcomer to computing, we feel that Symphony could well be too intimidating. Even after almost a week's continuous use, we still are not totally comfortable with the package, while we grasped the concepts underlying the other packages almost immediately.

At this stage, we can't really say whether Symphony is more absolutely powerful than other packages, since we are still learning to use it; but our impression is that while its spreadsheet is excellent, in terms of overall performance both Framework and Open Access are probably just as capable.

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THE INTEGRATED SOFTWARE SLEEPER



OPEN ACCESS is a new integrated software package from Software Products International, represented here in Australia by Software Suppliers Pty Ltd.

Open Access stands out among the packages reviewed as having an excellent balance between ease of use and economy of expression. A simple test we applied early in the evaluation was to try using each package without reading the documentation, in order to place ourselves in the same position as a first-time corporate user. Open Access

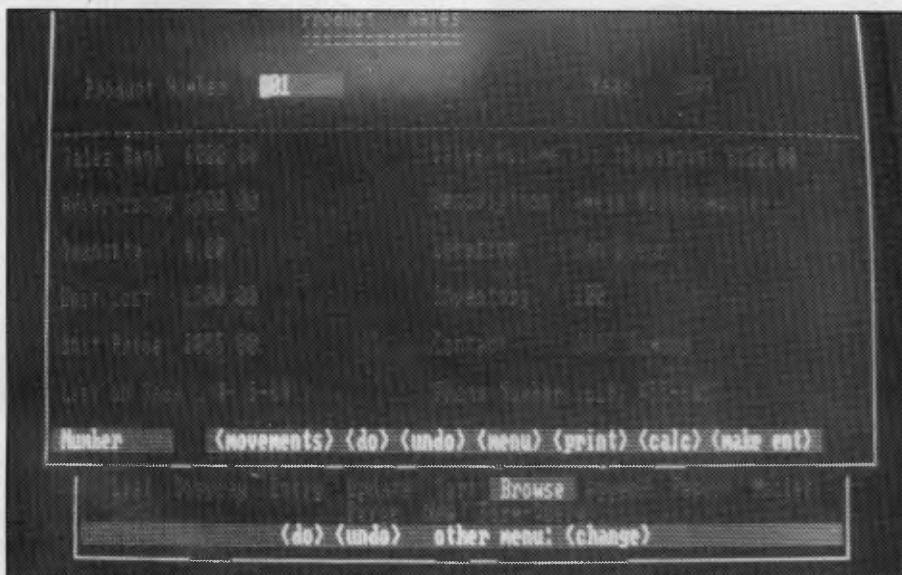
Of the integrated packages reviewed in this issue, Les Bell found that Open Access came out quite close to the top of the pile. It's a good example of economical programming yet at the same time easy to use, and has a few extra features that should make it extremely attractive to management and other financial manipulators.

was very straightforward, while Framework's use of the keys around the numeric pad made it virtually

unusable for the novice, and Symphony was just about as bad. Aura errs on the side of ease of use, running the risk of becoming tedious for the experienced user.

SPI took a quite different tack from the other software developers in the design of Open Access. OA will run in a 192 Kbyte PC — which is actually smaller than most corporate machines — but to do so it becomes disk-bound. That is, much of the code for the system resides in overlay files on diskette, and there are two diskettes full of code.

Similarly, data also resides primarily on disk; that is, where conventional spreadsheet programs copy a file from diskette to memory and then work on it in memory, OA works directly with the disk file. While there is a penalty in speed, there is also a payoff: larger models can be handled. Most spreadsheets have a 'specification' limit of 2048 by 256 or so cells, but it must be obvious that even with just one byte per cell, that would fill the



An example of the Open Access database in use.

SOFTWARE SHOOTOUT

memory of the typical PC. These are therefore theoretical limits, and real spreadsheets are a lot smaller.

The spreadsheet size for Open Access is 648,000 cells — assuming enough space is available on a hard disk — and all of that space can be used.

What You Get

Open Access is supplied as four disks and three manuals. Two of the four disks contain the programs, while the other two contain tutorial material and exercises. The main manual is quite a thick reference book, printed on thin paper in fine type. It's pretty dense, but fortunately you won't need it often, and it's better to have a comprehensive manual than one which omits information in the interest of not looking too intimidating (as some do).

There's also a supplementary manual for the Information Management sub-system and a tutorial introduction, which steps through the exercises using columns of 'Prompt', 'Response' and 'Explanation' information.

The OA user interface is very straightforward and easy to use, as the keys work in a consistent and straightforward manner — for the most part anyway. F10 always functions as the 'DO' key, and selections are made from menus by scrolling up and down using the arrow keys. Most

importantly, the ESCape key also functions as an 'UNDO' key, which gets you out of awkward situations. Often, the return key functions as a 'DO' key as well.

Word Processing

The Open Access word processor is extremely easy to use. At file creation time, the user can choose between creating a .DOC file, which will contain special characters for format control, or a .TXT file, which is a standard ASCII DOS file. This is a very handy feature.

It has all the usual options, such as margin specification, justification, headers and footers, top and bottom margins, you name it. Movement in the text is handled nicely, with the ability to move by word, sentence or paragraph; it's also easy to move blocks of text in the document.

The word processor can include information from spreadsheets and information management files, provided they have been stored as SIF files. In other words, data transfer between the modules of Open Access is not as transparent as with some of the other packages. Graphs can also be copied into the word processor at print time, as long as they have been stored in ASCII form.

Another useful feature of Open Access is the ability to merge names, addresses and other information into circular letters, although these will need to be of .TXT type.

The only difficulties we experienced with the OA word processor were with the delete mode, which behaves (to us) strangely, although it doubtless makes sense once you're used to it.



The screen as it appears when using the Open Access spreadsheet.

Spreadsheet

As mentioned above, the OA spreadsheet is disk-based, which costs some speed performance but gives the ability to handle much larger spreadsheets, with 3000 rows and 216 columns. It also has a number of other advanced spreadsheet features not found on the other packages.

Calculation order is determined by the spreadsheet design, using a natural order recalculation algorithm referred to as topological calculation. This means there is no need to worry about forward/backward references.

The display can be split into up to six windows and up to four spreadsheets can be displayed simultaneously. The additional models can also be explicitly linked into the main spreadsheet. For consolidation, Open Access offers a hierarchical consolidation scheme, with up to seven levels, and each model may have up to thirty sub-models on the next level down.

Another unusual feature for this class of modelling package is goal seeking, which allows you, after you have forecast a particular profit level, to say 'OK, what do I have to sell to attain this *higher* level of profit?'. The program actually uses Newton's method of interactive solutions to converge rapidly to the correct solution.

This feature enables OA to supply the kind of 'what if' spreadsheet managers and executives have always *really* wanted: the reverse spreadsheet. With this, you can simply fill in the bottom line — the profit you want to make — and specify the parameters involved that can be changed (such as retail price, number produced, materials involved and so on), and Open Access will tell you how to make that profit. It's really quite a clever feature.

At the user interface level, the spreadsheet is still quite easy to use, though it's nice to know you have these facilities available for complex problems. There are a couple of little funnies, though; for example, exponentiation is expressed, not with the infix caret mark ($x \uparrow y$) but with a function: (PWR(x,y)). This is logical but not awfully convenient in complex mathematical expressions.

The disk-bound nature of the spreadsheet obviously slows it down significantly. For example, replicating a moderately complex formula across 51 cells took 14 seconds, against a couple of seconds only for most of the other packages. However, there are a number of things that are possible with this package which

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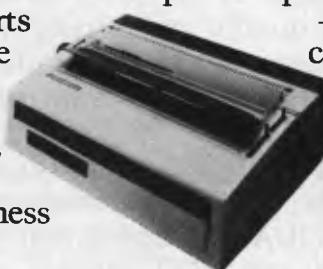
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'simply are not possible with the others. It's a case of horses for courses.'

Database

The Open Access database or information management subsystem is one of its strongest features. It is a true relational database system which could (and perhaps will) stand on its own in competition with dedicated database management packages.

The information management system allows the design of screen masks which can be used to enter data into files, and the same screens can also be used for enquiries. Simply key in the known fields and the program will retrieve the matching records. Data entry screens support validation and verification of a quite sophisticated level.

A browse mode allows you to display records in any key sequence down the left side of the screen, while the current record is displayed on the right.

As well as simple screen queries, Open Access is unique in supporting a database language which is similar in design to IBM's SQL (Structured Query Language). This allows queries to be posed in an English-like language. For example:

```
FROM CUST SELECT
NAME,PHONE WHERE NAME IN
SELECT NAME FROM ORDERS
WHERE PRODNO IN SELECT
PRODNO FROM PRODUCTS WHERE
UNITPRICE > 1000
```

This SQL language is not simple, but it is extremely powerful, allowing the user to join together up to five files and produce sorted reports on multiple conditions.

Each file can have up to 32,000 records and each record up to 55 fields, of which 15 can be key fields. Text, numeric, logical and date fields are supported.

Reports can be quite complex, with two levels of subtotals, up to 16 header and footer lines and up to 160 columns in the report. The report generator also supports functions like sum, average, count, max and min.

Graphics

The Open Access graphics system is the most powerful of those examined. It can display not only two-dimensional bar, line and pie charts, but can also create three-dimensional bar charts, can overlay line graphs on bar graphs, and can display separate bar, line and pie charts in windows.

Once graphs have been created,

they can be assembled into slide shows for executive presentations without having to repeat the data acquisition part of plotting the graphs.

The 3-D facility is particularly neat, boasting the ability to alter the viewpoint of the graph, giving different perspectives. One can also alter the colours, texture and outlines of graph segments, pull out pie slices and alter labels.

Graphs can also be saved as ASCII files for inclusion into printed reports at print time.

Time Management

I've often remarked that time is a precious resource for most managers, but Open Access is the only package which actually provides time management facilities. Frankly, I'm sceptical about whether such programs are actually ever used or simply viewed as a gimmick — some take more time to use than they actually save, and my own attempts to replace a diary with a computer terminal have been abortive. Nonetheless, if you want to use such a program, the facilities provided by Open Access are impressive, to say the least.

The OA time manager is designed for use by several individuals so that it can warn of schedule conflicts; however, it is able to cope with overlapping appointments. Up to 32,000 appointments can be saved per owner, together with up to 32,000 address and phone number cards. A search command allows you to retrieve appointments by name or by subject, as well as by date and time, of course.

The system breaks the day down into ten-minute intervals, which should be sufficiently precise for most users. Finally, you can also store up to 32,000 scratchpad monthly calendar notes.

Communications

The OA communications module is not quite as nice as the other parts of the system, mainly because it is not compatible with the Christensen protocol for file transfer. While the standard asynchronous 'glass teletype' mode is compatible with mainframes, minis and whatever, in object code file transfer mode OA is only compatible with itself. Naturally, the program can log the text dialogue to a disk file.

However, on the plus side, it should be noted that an OA system can be remotely controlled, allowing it to camp on an auto-answer modem for unattended operation. The remote user can initiate file transfer and other activities and then log off.

SOFTWARE SHOOTOUT

Integration

The integration in Open Access is also not quite as 'nice' as in, say, Symphony or Framework. There is no windowing capability, for example, allowing you to have a spreadsheet on screen while you write a report concerning it. On the other hand, it is easy to adjust your work style to accommodate this.

Cut-and-paste integration, though not recognisable as such, is quite simple and generally possible throughout Open Access. All you have to do is use the Context command to shift from spreadsheet to word processor, and your spreadsheet pops up as text. In some cases it may be necessary to perform the transfer through an intermediate SIF format.

The user interface is very straightforward and consistent throughout the package. Seven of the IBM-PC's programmable function keys retain a constant definition for all modules, and three are 'floating', changing meaning between modules. However, a help screen of key definitions is continually available.

The on-line help system is context sensitive, rather than being menu-driven, and operates quite quickly. If you do get into trouble, the 'Undo' key will often fix the problem. The documentation errs on the side of being complete and comprehensive, at the price of being somewhat intimidating, so the help facility has to work a bit harder than usual. Heck, most business users won't read the manual anyway.

The speed problem only affects the spreadsheet, and does so for a very good reason. If you are a highly strung individual who can't wait for five seconds while a spreadsheet recalculates, then OA is possibly not for you. But if you have complex modelling tasks beyond smaller spreadsheets, then it may be just what you need.

Overall, we regard Open Access as something of a 'sleeper' on the integrated software market. It is from a small company with no known track record, and it has its quirks, but it's an excellent overall performer.

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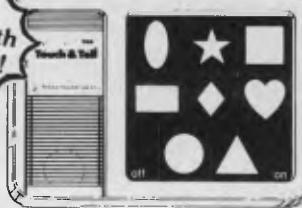
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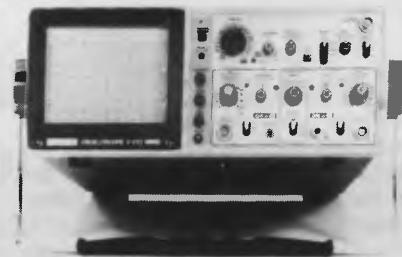


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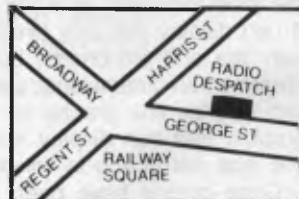
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A SIMPLE AURA

AURA IS PROBABLY the simplest package to use of all those examined. Its design is intended to favour easy operation, and relies heavily on menus and prompting. This also makes it very slow, and therefore tedious to apply once you know your way around the system.

The package comes on ten disks, which all have to be backed up before use. Every one of these disks is required for running the package, so there is a lot of juggling involved if you don't have a hard disk. For example, the word processing application actually consists of two disks: the 'Word Processing Program' disk and the 'Word Processing Menus' disk.

Installing Aura is very straightforward, if time- and disk-consuming, and the documentation is well organised and laid out for the first-time user.

Word Processing

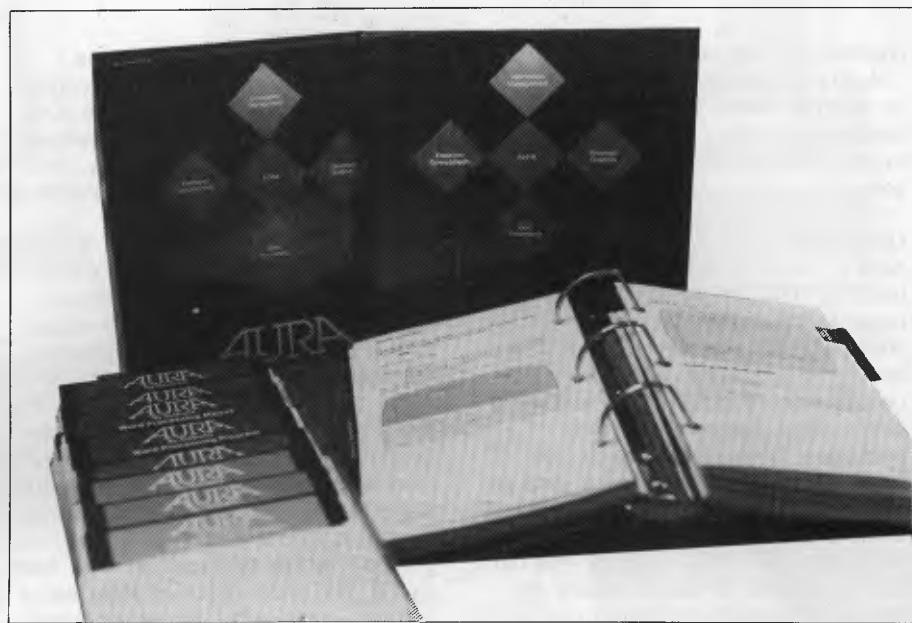
The Aura word processing subsystem is characteristically easy to master, since it makes extensive use of the function keys. One problem is that these function keys have different definitions in the other Aura applications, so it is difficult to keep track of what key does what. This is precisely the kind of problem integrated software is supposed to avoid.

Once the user has entered a word processing menu, such as the one for file creation, it is often impossible to exit, though sometimes pressing F3 will work.

Aura provides help menus throughout the program, and operations such as reformatting text, setting margins and block operations (moving, copying, deletion) are very easy. Formats are defined by ruler lines, of which there can be up to ten in any document.

Up to three documents can be edited at one time.

Integrating other documents into the word processor is also painless;



Easy is the word that comes to mind most often in relation to this package. But while easy is best for beginners, few people remain novices for long – and easy can become tedious. Besides, says Les Bell, you know what they say about life ...

conceptually it's like reading files into a WordStar document. If a spreadsheet segment is read in which is too wide for the current margin settings, Aura simply wraps it around.

Spreadsheet

The Aura spreadsheet is of limited size: 63 columns by 255 rows. While this is small compared with other spreadsheets, it's adequate for most applications – though a few more columns wouldn't go astray for doing analyses over long time periods.

Aura makes up for the small size of its sheet by providing excellent consolidation and spreadsheet linking facilities. For example, a formula in one spreadsheet cell can refer to cells in another spreadsheet. If the cursor is placed on a cell which has been carried over and the F7 'Zoom' key is depressed, the display switches to the spreadsheet from which the cell was derived.

Aura's spreadsheet supports quite an extensive range of functions, including Variance and Standard Deviation, Internal Rate of Return, Net Present Value, and Iterative Solution.

Database

The Aura database is strongly screen oriented. Database creation is (you've guessed it) menu-driven. Fields can hold numbers or text, with maximum lengths of 16 and 255 characters respectively. Screen creation is assisted by the word processing function keys; for example, fields can be centered automatically. Up to 256 fields can be defined per record, with up to eight indexes per file, and the number of records is claimed to be limited only by disk capacity.

When the form is in use for data entry, however, editing facilities are no longer available. For example, you cannot insert while editing a field, nor can you skip backwards between fields; so if you notice a name is misspelled while entering the address, you can't go back and fix it.

On the good side, the database can find records on any field, regardless of whether it is indexed or not, and can search on multiple fields.

Report formats are defined in exactly the same way as screens, although you have several additional options such as the number of copies, subtotaling, page breaks, and

SOFTWARE SHOOTOUT

counting of field entries.

Aura's database can sort on single or multiple fields, in ascending or descending order, and can sort back to the existing file (which makes me somewhat nervous).

Graphics

Aura's graphics capabilities are quite unusual. The program allows for the usual business graphics, such as pie, line, bar, clustered bar, stacked bar and line/bar graphs, and allows the combination of graphs and text on a single page. Unlike most such packages, however, in which you have to manipulate the input data to change the graph, Aura allows you to work directly with the graphics. This extends to the ability to draw free-hand on the screen, a useful feature for the production of corporate organisation charts and the like. You can draw

lines, boxes, arcs and polygons.

Aura also provides detailed control over conventional graph details. One can, for example, specify the positioning and direction of graph legends, and the scaling, positioning and rotation of the graph.

Aura's graphs come in two flavours: static and dynamic. The first shows data as it existed in the database, while the dynamic graphs are linked to the database and instantly reflect changes in it.

We found that transferring data into the graphics module was context-dependent. For example, the graphics module can directly acquire data from the database (or from the keyboard), but spreadsheet data has to be graphed in the spreadsheet first, then saved, and then reloaded into the graphics module for further enhancement.

Communications

A new package called Auracom adds communications capabilities to Aura. Although this was not available at the time of writing, the specifications are impressive and rival the best of other packages. Auracom uses XMODEM (Christensen) protocol, can be left for unattended operation, and includes features such as autodialling, redialling, VT100 emulation and split-screen dialogue with other Aura systems. It will also be available as a stand-alone package.

Other Features

Aura includes a 'macro' facility which allows the user to store sequences of up to 32 operations to be repeated automatically. In addition, the Aura menus can be customised to provide single-keystroke access to these advanced functions, thus making the package programmable (albeit on a low level).

Aura's documentation is the most bulky of the packages reviewed, and possibly the most helpful to the first-time user. The overall design of the program is also better suited. □

SUMMARY

AFTER EXTENSIVELY testing these packages, we have found no obvious deficiencies in any of them. None of them fall over, do unexpected things or otherwise misbehave. They all do what they set out to do, albeit in dramatically different ways.

All are far better solutions than we have had before, and it is difficult to be critical of tools which are an improvement over the previous generation. What really needs to be said here is that since each package is different, they meet different needs.

For example, if you are a financial manager or accountant, then you are likely to have a strong spreadsheet orientation, and that ought to be your major consideration in selecting the appropriate package. Generally, most users in this category will be happiest with Framework or Symphony. Framework is more general, Symphony more spreadsheet-oriented. If you are definitely not a computer type, then perhaps Aura might suit you better, on account of its ease of use, while if you are a dedicated IBM PC user, then Symphony or Open Access would be better. In particular, if you are strong on modelling, Open Access will cater best to your needs. Those who are in positions which involve a lot of report writing will probably prefer Open Access or Framework. Framework's outline

processor, in particular, makes it suitable for report writing, and the ability to include graphs and spreadsheets in reports is a bonus.

Sales and marketing management types also fall into this category; they tend to be visually oriented, and here Open Access scores well with its 3-D graphics and the ability to produce slide shows.

Production managers, those in manufacturing industry and others, are examples of people who have to look after a lot of data. Again, Open Access scores well with its very strong database package, while those who prefer the Framework package might consider combining it with dBase II or III to provide a top-level database system.

Self-employed professionals might also opt for this approach, as they

Package	W/P	Database	Spreadsheet	Graphics	Comms	Ease of use	Ease of integration	Documentation	Power (rrp)	Price
Aura	1	4	4	4	4	1	3	2	5	\$795
Framework	1	2	2	2	1	2	1	1	2	\$795
Symphony	1	5	3	3	3	5	2	4	3	\$995
Open Access	1	1	1	1	2	4	2	3	1	\$995

Table 1. This table is an attempt to summarise the qualities of the four integrated software packages reviewed this issue: Aura, Framework, Symphony and Open Access. The ratings are based on a score of 1 to 5, with 1 being the highest.

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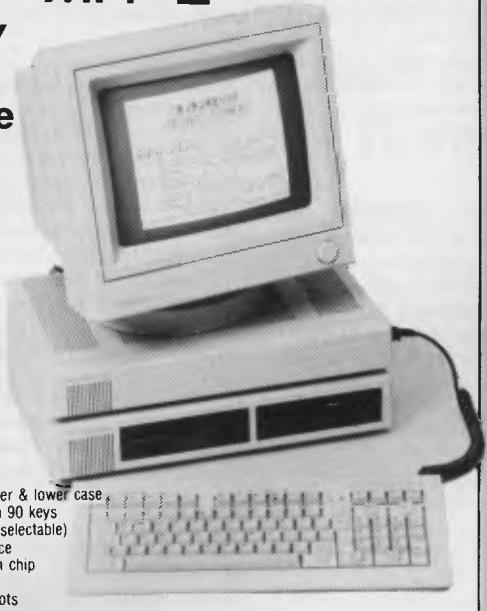
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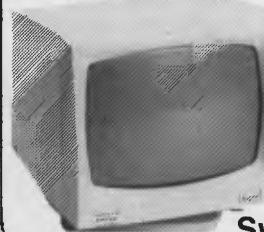
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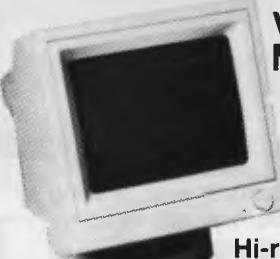
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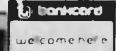
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The Test...

NB: All names, products, market characteristics and so on mentioned in this article are purely fictitious, and any resemblance to any companies or products is purely accidental.

INTEGRATED software is of use — as is any software — only in so far as it assists the user to solve real problems. In testing these packages, we set out to create a 'typical' business problem: typical in that it is precisely the kind of situation which these packages are intended to simplify.

We have set out to emulate a day in the life of a marketing executive; a product manager, say. He is in charge of new product development for his company, and has set aside today to finish off a major project.

His employer, the Acme Coffee Company, has come up with a formula for a new instant coffee, and today he has to make a recommendation to the Managing Director as to whether it should be brought to market or not. To do so, he must evaluate the likely performance of the new beverage in the marketplace, based upon figures supplied by the Market Research department. The instant coffee market is fairly static, and the only way to sell a product is to convert existing consumers away from competitors' products.

So given that research has shown that Acme can induce x per cent of each competitor's customers to switch brands, he simply multiplies each competitor's sales (derived from B.D. Olsen warehouse withdrawal data) by the switching percentage, adds these up, and gets the sales he can expect. But not quite; nobody has even heard of Brand X coffee, and so he must give some time for the advertising campaign to work. This is done by superimposing an S-shaped curve, known as a Gompertz curve, over the sales data.

He must then use monthly sales data, together with a variable budget prepared by Manufacturing, as input to a discounted cash-flow table to show the internal rate of return for the project.

Whatever is decided, he must write up a report with his recommendations and justifications, preferably supported by graphs of revenue, manufacturing costs

can use dBase for invoicing and accounting.

In many cases, personal preferences will come down to a single feature being desirable in a particular application. For example, many corporate users will appreciate Symphony's ability to protect macros from alteration, making it possible to generate turnkey spreadsheet applications for end users. Others will see an immediate use for Open Access's password protection on files.

and the like, so that the MD (who is notoriously slow at reading reports) can follow it all.

Ideally, he wants to be able to work at home, where he can get away from interruptions and telephone calls, and send the resultant report through to his office by electronic mail for his secretary to print out and deliver to the MD.

The Lisa

The process was relatively straightforward on the Lisa, except for a few mismatches between the LisaCalc spreadsheet format and the LisaGraph graphics program. We created the initial spreadsheets fairly quickly, producing weekly forecast sales figures based on the percentage of brand swapping we could induce in consumers of rival brands. The only problems came in transferring sales data from the spreadsheet to the graph.

On the spreadsheet, time flows across the page, but on the LisaGraph worksheet it flows down the page. The transfer therefore involves rotating the data through 90 degrees, something that is only possible by selecting an entire row — but that means taking labels and other extraneous data which we don't want plotted. Some editing of the data is therefore required before the transfer.

The other area which the Lisa found difficult was in creating a row of monthly data for transfer to the budget spreadsheet. Here it is easy to create a row consisting of three blanks, the monthly figure, three blanks, the monthly figure and so on, but it's not so easy to create a row of thirteen entries with no blanks between them. The replication process (copy and paste adjusting) is no help, so the thirteen entries had to be created by hand. However, this problem is more or less endemic to all current-generation spreadsheets.

Cutting from the spreadsheet into a word processor document is extremely simple and works well, although the left margin of the spreadsheet data does not agree with that of the text, necessitating some editing.

On the communications front, the Lisa does not have a raw binary file transfer between machines which would allow the transfer of non-text files such as spreadsheets and graphs, so our mythical manager has to physically transfer the

paper from his printer to his boss.

All in all, though, a quite creditable performance with arguably the greatest ease of use of all the packages surveyed.

Framework

Framework managed the test without too much difficulty. In the initial sales forecast spreadsheet, the multiplication of each week's sales for each competitor by the brand-switching factor was simplified considerably by Framework's simple method of fixing references in replicated formulae through prefixing with a '\$' sign.

Provision of Christensen protocol file transfer meant that we were able to transfer the report to our Compupro system running YAM, although since it can't run Framework, we couldn't do anything with it once we'd got it. However, it raises the possibility of running a bulletin board with XYAM as a central electronic mail system.

Open Access

Open Access managed quite capably, with no problems at all. In fact, the communications options of Open Access were best able to handle the electronic mail requirement by transmitting the entire report plus associated graph (.IMA) files in master/slave mode.

Symphony

Absolutely no difficulties with Symphony; its spreadsheet sailed through the test with flying colours. The word processing was fairly easy to add around the spreadsheet once we'd got the hang of the commands, and the graphics was very easy to use. The comms package gave us a few problems at first, but seemed okay once we got the hang of it.

Aura

It's well nigh impossible to go wrong with Aura, although we did experience some difficulty with replicating formulae which included mixed absolute and relative addressing. Once we'd figured out its syntax for this, the problem went away. We also had some difficulty graphing from the spreadsheet; what we didn't realise is that spreadsheet graphics are built into the spreadsheet and aren't part of the graphics module. Lack of comms (soon to be fixed) stopped us transferring the report to the boss.

One final caveat: these packages store their word processor files in non-standard, non-ASCII format, making it impossible to use off-the-shelf spelling checkers (and other WP tools) with them. If your spelling is atrocious, you may still need a separate word processor.

We've experimented with a ranking of the packages in different ways: see Table 1 for the summary.

Frankly, we'd be quite happy with virtually any of these packages.

Postscript: just as we went to press, Dr. Peter Eichhorst, President of Software Products International, announced that Open Access would be unbundled and its component parts made available separately. He also announced a new networking version of Open Access, which runs on Corvus Omnidat, 3COM Ethernet and IBM's PC Network. This version includes database record locking and model locking for the spreadsheet.

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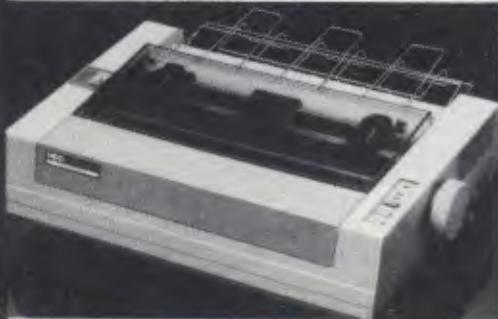


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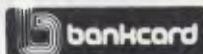


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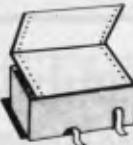


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Some Surprises

The judges have been particularly impressed by the high standard of entries. Several of the packages submitted have already made it into production as commercial software, while others will obviously end up on the market before long.

Some of the more interesting packages received included the following (although this is by no means an exhaustive list):

- Two complete language implementations – a Pascal compiler, and a C compiler.
- A full medical management system.

- Several job costing and quoting systems.
- A genealogy program (an area with too little support locally – this one may excite the family historians among the readership).
- Several disk library cataloguing systems.
- Two or three home finance-type packages.
- A comprehensive suite of statistical analysis programs.
- A superannuation and tax forecaster, and a teacher's student-report writer.

YES, IT'S *almost* yours – if you happen to be the lucky winner in the Great Aussie Software Competition.

But you'll have to wait a few weeks to take delivery of your \$14,000 prize, because we haven't made up our minds yet! We had hoped to announce the winner in this issue, but choosing a clear leader out of three boxes full of excellent entries is proving a mammoth task.

Our staffers probably don't do as many software reviews in a year as we are currently having to carry out on the packages submitted for the competition – and as each one is, effectively, a product review in itself the judging is consuming any free time we have, and more . . .

So far we've managed to wade through the entries twice, in an effort to bring it down to a short-list of around 10 programs. Now comes the hard part – a 10-way 'comparison test' to determine the five place-getters.

You'll have to keep your fingers crossed for another few weeks – we now plan to publish the results in the January issue, which should go on sale just before Christmas.

MORE ADVANCED NEC-ING

FROM ITS packaging down this one is a quality product. It arrived in three substantial cartons, one for the documentation and software, another for the main system unit, and one for the monitor. Mount Crisis groaned yet again as the unpacking ritual diminished our floor space even further. We look more like a warehouse than a family residence.

The packaging is neat and carefully designed to minimise shock and moisture penetration. The system unit was in a resealable carton encased in a hermetically sealed plastic bag complete with dessicant. Both the system unit and separate keyboard were dressed (literally) in cute elasticised clear-plastic slip-on covers. In the same box was a device best described as a modesty cover.

Modesty cover? It would seem the APC designers had a thing about trailing cables looking untidy. They are. With a separate keyboard, monitor and printer you wind up with a total of five cables writhing around the rear of the machine like vines in a jungle. Count them: a main power cord to the system unit, a secondary power cord from the monitor to the system unit, a video connection from the monitor to the system unit, the keyboard cable, and the cable to the printer.

Hence the modesty cover. It clips on the back of the system unit, allowing you to crumple the excess

footage into an out-of-sight position. There's even a cute little hinged cover behind the video monitor, to hide away the unsightly video and power connections. Oh so modest we are. It's all reminiscent of the way we oldtime mainframers used to hide the horrid cables underneath the raised flooring of the Computer Room.

The initial impact is one of Class. Even the floppy disk drive has a futuristic mark about it. When a disk is ejected, it emerges from the drive with a smooth, slow and deliberate movement. Quite pneumatic.

The rear of the machine provides connectors for power, the keyboard, monochrome monitor, colour monitor, an RS232 serial port, and a parallel port for the printer. The fan exhales to the rear, and there are covers for the four expansion slots. There is also a ten-way DIP switch for setting various system options.

Undressing the system unit is quite simple. Six Phillips-head screws hold the metal cover in place. Not that the average user would ever need to perform this operation. Even the installation of an option card may be carried out without removing the cover.

Once revealed, the inner workings of the system unit still proclaimed Class. The engineering workmanship and finish are among the best I've ever seen. It's clearly designed for ease of maintenance. Although there

is a main circuit board, other small modules control specific functions such as the disk controller and power supply. There is adequate space for forced air ventilation.

A small pneumatic controller on top of the 13 cm TEAC floppy disk drive explains the slow disk ejection system. Very elegant.

The review system had a single floppy drive and a 13 cm hard disk drive, both built into the system unit. Other configurations are available, ranging from a unit with only one floppy disk (hardly a proposition) to one with two floppy drives and an external hard disk. Unfortunately, all the units with RGB monitors had been shipped to dealers, so I wound up with a monochrome monitor. When preparing my previous article on the APC III, the review machine was a pre-release version with a colour screen and full graphics. Those graphics were fast. In contrast, the present machine has no colour graphics capabilities, although it offers several monochrome graphics modes under the control of an NEC 7220 graphics display controller (GDC).

The previous review machine had a high-resolution RGB display giving 640 by 400 pixels, and eight simultaneous colours. This is twice the resolution of the standard IBM colour card, and twice the number of displayable colours. On that monitor the characters are so clear it is



Last month Frank Lee wrote a quick preview of the NEC APC III. For this issue he took the time to get better acquainted; he found the new NEC machine to be modest, though fast, of a good family, though not afraid of serious work.

difficult to identify individual pixels.

Both the RGB and monochrome monitors come mounted on an elegant tilt-and-swivel pedestal. Brightness and contrast controls are easily accessible from the top of the monitor unit. Since the monitor is connected to a switched power socket on the rear of the system unit, its own power switch may be left on so that the whole system may be powered up from the single switch on the face of the system unit.

Putting in the Boot

What an unfortunate expression – 'booting the system'. How often I have wished to do just that (not to this system as yet). According to my wise Uncle Phil, the expression used among 'real' computer people is 'IPLing the system'. IBM introduced the phrase 'Initial Program Load' back in the dim Fifties, hence 'IPL'. Let's have a bit of class in this microworld, and use terms of distinction.

To IPL the APC III, one simply

switches it on. Alternatively, you can push a recessed button on the face of the unit to achieve the same effect. A 'soft IPL' (I love it) is performed by simultaneously pressing the three keys <Fn> <Ctrl> <Break>. This causes the screen to blank completely for just on 20 seconds (yes, even when IPLing from a hard disk) before requesting the date and time. Uncle Phil says it's better than when he used to IPL an old IBM 360/50. In those days, the disk IPL took so long, you could go make yourself a cup of coffee while the system did its thing. No one knew what its thing was, however.

When the APC III asks for the time and date, one gets the impression the questions are a bit unnecessary. It tells you the current date and time anyway (they are maintained by a built-in calendar clock). You complete the IPL by responding to each of the two questions with the <Return> key.

Read Me First

The 'Read Me First' documentation supplied with the system is first rate. Printed in full colour, the Owner's Guide carries even the thickest owner through the necessary terminology, where to put all the goodies, how to connect them all together, and how not to clobber your floppy disks. The Guide has a pocket in the rear containing two floppy disks, a 'system checking program' and an 'APC III Demonstration'. The owner is encouraged to load the system checker (which boots the system) and to follow the detailed ball-by-ball description on checking out the keyboard, the memory, the monitor, and all that jazz. There's even a separate, well-illustrated manual supplied with the Guide, to provide further details on the system checking program. The demonstration package was a bit of a disappointment, since the unit does not have colour graphics, and most of the demonstrations are naturally geared for graphics. Also, mine won't play a tune because it doesn't have a sound/joystick option.

Nevertheless, if you actually bought the thing to do some work with, then the graphics are really (in my opinion) an optional frill. Sour grapes, Frank?

Along with the Owner's Guide is a neatly presented letter to us Aussie users; an 'Addendum for the Australian Version'. 'Twould seem that we down under are somewhat better off than our North American cousins with APC IIIs. The American version sports only 320K per floppy drive, to keep it compatible with the IBM PC disk

format. According to the Addendum, "Your NEC APC III has been fitted with higher capacity 640 Kilobyte floppy disk drives". That's right, quad density (96 tracks per inch). The catch is that you can't write IBM formatted disks, although you can still read them. A small price to pay for all that extra storage.

Using the Hard Disk

The system checker program also checks out the hard disk. I suspect it also scribbled all over the disk, for when I tried to log on to it (as drive C), some rather rude messages appeared on the otherwise clean screen — whereby hangs a tale.

With one floppy drive, MS-DOS treats it as two logical drives, A and B. The hard disk is supposed to be C. Alas. To initialise a hard disk, one really needs a set of hard disk utilities. For example, on the President machine, the system disk contains a PRIME, FDISK and PARK set of utilities. PRIME does something magical to the disk (and takes a long time to do it). Presumably it does some sort of special format. FDISK partitions the disk, and PARK is used (you guessed it) to park the head in an unused part of the drive so that the recorded area isn't clobbered by nasty bumps.

On the system disk supplied with the APC III there was nary a thought for the hard disk. Would I dare try a FORMAT C:/S? Not on your nellie. It might have worked, but it isn't my machine. So a quick test of NEC's support system was in order. I first rang my contact at NEC who had arranged delivery of the test machine. After being transferred to a Technical Person, I was told that the omission of the required utilities was an oversight, and one of the inevitable teething problems when introducing a new machine. Fair enough I say. I simply had the wrong system disk (or the right disk for the wrong machine).

Well, you've got to hand it to NEC. Within three hours a courier had arrived with the do-not-staple-do-not-fold floppy, and we were back in hard business. Maybe you wouldn't get that kind of service if you lived in Bandy Wallop, but in the Blue Mountains that's pretty cool.

The disk contained a utility called HDSETUP, and the important pair BACKUP.COM and RESTORE.COM. A READ.ME file explained that documentation for the hard disk was in preparation, but in the meantime it provided simple instructions for bringing up the hard disk. HDSETUP

is menu driven, and allows one to define partitions for the hard disk in terms of tracks to be used. It also lets you specify which partition is to be the auto boot partition (if there is no disk in the floppy drive). Of the 1240 available tracks, I created the maximum single MS-DOS partition of 1238 tracks, leaving two tracks for partition information. This partition was then activated for auto boot.

The next step was to format the disk (FORMAT C:/S) in the usual way. Finally, a copy of the original system disk and the hard disk utilities was copied to the hard disk. The READ.ME notes explained that to boot from the hard disk it was necessary to hold down the PF1 key when switching on the machine, and to hold down that key until the boot was effected. This worked, but what a time-consuming and boring exercise for the index finger! As an experiment I tried just switching it on with nothing in the floppy drive. Sure enough, it booted. Maybe the PF1 key was for a first time boot. Who knows?

With 1238 tracks, CHKDSK told me that the total disk space was 10,504K, or a strange 8.485K per track. The review machine has the minimum RAM configuration of 128K.

Basic Architecture

For those who missed last month's brief overview of the APC III, here are the salient details. The CPU is an 8 MHz 8086-2 microprocessor, a true 16-bit machine with roughly twice the speed of the IBM PC's 8088. The standard machine comes with 128K of dynamic RAM and 32K of 'ROM BIOS'. An additional 8K is reserved for text RAM. There is one serial port, a parallel port, two hard disk ports, a battery-backed calendar clock, a detachable keyboard and a 35 cm monitor. Four internal expansion slots (non-IBM) allow for additional options.

The main memory is upgradable to 640K. However, the screen mapping conventions for colour and text are not IBM-compatible. Indeed, NEC has maintained its position which it adopted with the original APC — namely avoiding compatibility with the IBM PC. Its argument was simple: why copy an obsolete architecture? After all, both APC's can still run many MS-DOS applications.

Under MS-DOS, one has access to the GSX Graphics Extension, keyboard remapping, a RAM-DISK utility, screen dump utility, and five possible modes for each of the twelve function keys.

The Keyboard

The keyboard has a good feel to it, and the layout is well suited to the touch typist. There are function keys on the top row, together with a 'function' key and two page scrolling keys (PgUp and PgDn). In addition to the standard QWERTY keys are two special keys for invoking graphics characters, and an ALT key. To the extreme right of the keyboard is a cluster which includes a normal numeric keypad, cursor controls, a separate ENTER key, keys to insert and delete, a 'clear home', a 'print' and a 'break stop'. Most of these have counterparts on the keyboard of the IBM PC.

The Key deletes an entire command line. The <Print> key causes the system printer to echo all characters written to the display. The combination of <Shift> and <Print> causes a printer dump of all screen text information. <Shift> <Ctrl> <Print> dumps the screen graphics data to the printer. The <Break Stop> temporarily stops the transfer of characters to the display.

At the top of the keyboard is a slot to hold your template, which typically defines the effects of the various function (PF) keys. The MS-DOS package supplied includes a template for that operating system. There is even a slot underneath the keyboard where one can store the various templates supplied with software packages.

Two 'comfort brackets' allow adjustment of the angle of the keyboard to suit a typist's requirements. A keyclick utility lets you specify whether or not you want a soft beep, or just silence when keys are depressed. Frankly, I prefer silence when I'm depressed.

Interestingly, the system includes a non-volatile memory in which are stored such things as your key click preference, serial baud rates, and the like.

APC III Utilities

Apart from the standard set of MS-DOS utilities, there are some designed specifically for the APC III. According to the release bulletin supplied with the main documentation, these utilities require that the ANSI.SYS device driver be loaded at boot up time. This is automatic with the supplied configuration, since ANSI.SYS is included on the system disk, and the CONFIG.SYS file specifies DEVICE = ANSI.SYS.

The CHATT command changes and displays file attributes in a manner most similar to old CP/M's STAT



command. As with most of these commands, if the command name is typed with a following question mark, a summary of the purpose of the command is displayed on the monitor.

COLOR lets you specify the default screen colour for a colour monitor, or the grey tone intensity for a monochrome monitor. COLOR WHITE sets full intensity, and COLOR GREEN sets half intensity on my monochrome screen.

CRTDUMP loads the CRTDUMP resident extension into main memory. Once loaded, the APC III can dump its screen to the printer. One can specify a magnification ratio of 1, 2 or 3 as a parameter. With CRTDUMP installed, text or graphics can be dumped under program control through appropriate escape sequences. Graphics can only be dumped to the NEC Pinwriter P2-3 or 3-3.

DISKCOMP compares the contents of two floppy disks on a track-by-track basis – useful if you want to verify a back-up copy, or if you are preparing production software for sale.

KEY allows the reprogramming of the APC III keyboard, including the programmable function keys. For example, the command

KEY PF3 CTRL "DIR A:" 13 would set up the <Ctrl> <PF3> combination to act as if you had requested a directory of drive A. Unfortunately, key assignments are not stored in the machine's non-volatile memory, so the keyboard is reset to the 'standard' layout each time the operating system is rebooted. There is a way to preset your keys using a special file to nominate key assignments. This file can be prepared with the KEY DUMP > filename command, and the file may be edited as required. If the command KEY < filename is included in an AUTO-EXEC.BAT file, then the keys will be

reassigned automatically.

The KEYCLICK command allows you to enable or disable the key click tone.

The MOUSE command configures the GSX device driver to accept input from a mouse. The device driver will set the serial port baud rate and communications protocol for the specified mouse. You may nominate NONE, MICRO (for Microsoft), MOUSE (for Mouse Systems Mouse) or SUMMA (for Summagraphics Mouse).

The PRINTER utility sets up the appropriate default port and parallel port parity when a printer is specified. There are six supported printer types, all of them NEC products.

RAMDISK can be used to set aside part of the main memory as a RAM DISK, or to return the RAM DISK space to the user memory. Since the 'disk' size must be allocated in units of 128K, I was out of luck with my standard system. You need at least 256K of main memory in order to use this beastie. In common with most other RAMDISK utilities, you will lose the contents of your 'disk' if the system is powered down, even if only for a moment. Somewhat surprisingly, the RAM DISK contents are not lost if the system is 'warm booted' with the key combination <Fn> <Ctrl> <Break Stop>.

SETCOM operates rather like the normal MS-DOS MODE command (which is not supplied). It is used to set the operating parameters for the standard serial port.

The MS-DOS System

When MS-DOS is purchased from NEC for the APC, you receive four diskettes: the MS-DOS System Diskette (Ver. 2.11), the Macro Assembler Package, the GSX Drivers, and the GSX System Diskette (Version 1.3). This software is accompanied by the MS-DOS User's Guide, a Programmer's Reference Manual, and a two-volume Macro Assembler Manual. I think there should also have been a GSX-86 User's Guide, but it was not delivered.

All the documentation is presented in the now almost standard format – an octavo three-ring binder with the diskettes set in a plastic pocket page. Unfortunately, these binders were not boxed (as are the IBM and DRI equivalents). I miss the boxes. They stay behind on the bookshelf marking the place when the manual is in use. They also prevent the manual covers from being distorted by the tension in the usual heat-shrunk wrapper.

The distribution MS-DOS disk includes a READ.ME file revealing the latest information which didn't find its way into the documentation. It also provides a listing of the distributed files on all four diskettes, as well as a few errata in the manuals.

The supplied Programmer's Reference Manual is essentially the standard Microsoft machine-independent documentation, bound together with a substantial addendum providing the application or system programmer with all the details necessary to make effective use of the machine's unique architecture.

The Benchmark Test

The standard benchmark I have been using lately is a somewhat revised program for finding prime numbers using the algorithm known as Eratosthenes's Sieve.

To test it on the APC III, I made a copy (from the President machine) of the PL/I compiler, the linkage editor, and the source program PRIMES.PLI on a normal IBM-style floppy disk. The idea was to compare compile, link and execution times. Unfortunately, although the disk was readable by the APC III, it seems PL/I-86 needs somewhat more than 128 Kilobytes of RAM in which to function. At first I blamed the resident GSX handler (which I had loaded to test the GSX example). Even after removing the GSX handler, the same problem occurred. Nor was it due to the resident ANSI.SYS device driver. It's just that PL/I-86 is RAM hungry.

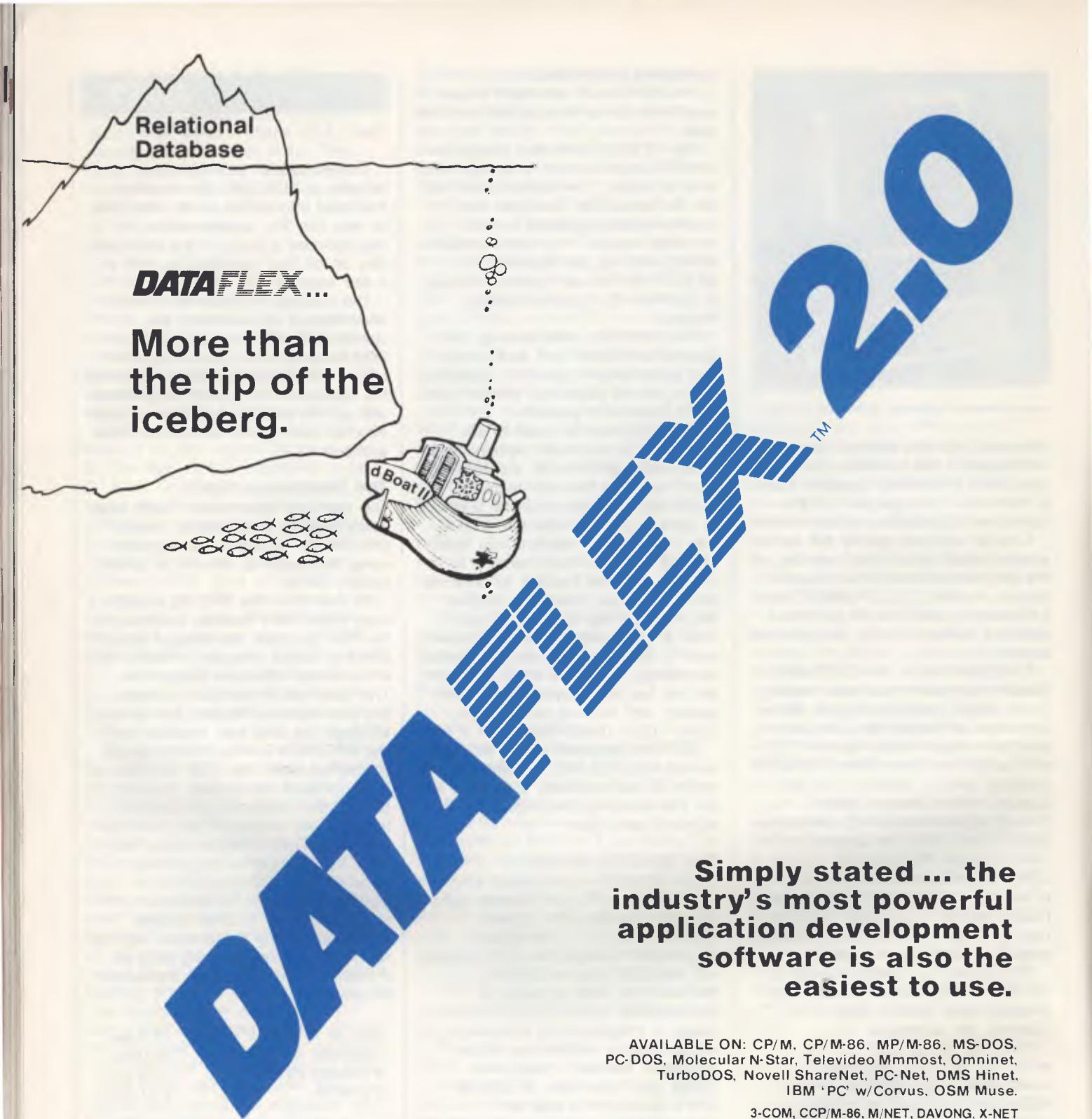
So abandoning the compile test, we simply ported the resulting program (PRIMES.EXE) and ran it. Here are the results:

APC III	11.5 sec
Datamax	28.0 sec
President 2010M	25.3 sec
PortaPak	21.7 sec

Now that's something. And I know for a fact that the 8087 socket in the APC III is empty. Remember this is strictly a CPU performance test.

To get some sort of comparison between an IBM PC clone and the APC III in a job involving the hard disk, I copied the file PRIMES.OBJ from the President to the APC III, and tried the linker (LINK86). This is heavily disk dependent since it must

Continued on page 130



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Hothouse Computers

4

Cultivating plants for sale has become a high-tech industry — so where does that leave the small nursery owner? Should people in glasshouses throw their manual systems out, or don't pansies, poplars, computers and potting mix? A renowned lazy gardener takes a candid look at these and other questions.

BY DON BURKE

Electric Desk

10

Our US correspondent is not totally satisfied with this integrated package for the IBM PC, XT and PCjr; but he holds great hopes for the vendor ironing out the wrinkles and turning Electric Desk into an excellent tool for business people.

BY HOWARD A. KARTEN

Fitting Out the Electronic Boss

15

Yves Saint Laurent, Chanel, Valentino and Pierre Cardin used to be the names distinguishing the executives from the herd. Now it's the labels on your calculator, modem and lap computer that count. The trappings of the electronic boss are many and expensive — do you need them all?

BY NORMAN KEMP

Movies on Computer

20

After a period of astonishing growth the video rental industry seems to be settling down, with successful vendors consolidating their businesses.

Computerisation is an obvious step in an area where its important to keep track of a large amount of stock and numerous customers. We look at the experiences of a Wollongong hire firm with an IBM PC.

BY NORMAN KEMP

Compaq Takes on the Heavyweights

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The company which can boast having had the most successful first year of sales ever in American business history is facing hefty competition from giants such as AT&T and IBM. This article looks at the Compaq range of computers and its chances of survival.

BY NORMAN KEMP

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Growing plants for sale is no longer a matter of potting a few seedlings, adding some fertiliser and watering once a day. Market demands have made horticulture a high-tech pursuit. Here Don Burke gives an objective appraisal of what computers can do for nurseries.

HOTHOUSE COMPUTERS

Being of Irish descent, I have always hated bureaucracy. I am for the little man, the battler; for small dogs, minority groups and the oppressed. Many is the time I have rescued a terror-stricken green-grocer cicada from the rapacious jaws of a mynah bird, or fought for lost causes.

Those who read my meagre offerings in *Australian Horticulture* will long since have perceived my windmill-tilting, reminiscent of an earlier Don (Quixote). So, when I was asked to write an article on the use of computers in nurseries, I said to myself: "Bring me my noble steed and my lance and the Golden Helmet of Mambrino - I shall fight!"

When, as a lad, I first heard about computers, my Irish nostrils flared instinctively and the hackles on my back stood erect. Little did I know then of the barrage of letters I was to receive over the next 20 years, accusing me of not having paid bills, invading my privacy by offering me *Readers Digest* books, Art Union tickets and supermarket specials. At university I sat for a test and was told I had an 'outstanding aptitude' for computer work. Who were these machines to pass judgment on me! Shortly thereafter I designed a computer program which jammed the computer in a single process - forcing it to spew out masses of never-ending paper. To rectify the situation the university had to shut down the whole system. In those days, computers were a massive series of machines filling large buildings and they needed to be kept running - no-one was very happy about my 'mistake' (only the

computer and I knew what had *really* happened).

These days, computers are much smaller. You could fit one in a suitcase that could do more than the huge, old university machine I knackered.

Ironically, some years later, after I had left the university as a student, I was back there as an employee, sorting out problems with the computer. (It was this that finally drove me to the verdant, then computer-free, world of horticulture.) When punching in bits of info to these monsters, I would occasionally make a mistake - making it necessary for me to push an 'error' button. I, a human being, had to admit my mistake and apologise to a machine! This was a world gone mad!

Better Management Before Computing

But no, they say, the new machines are 'user-friendly'. You can talk to them and they 'talk' back. For a mere \$5000 to \$10,000 you can have a chat with a machine! In the February 1982 issue of *Australian Horticulture*, I wrote an article entitled 'Computers in Nurseries - Look before you Leap', and I must admit that things have improved since then. In that article I stated:

"The main thrust of the argument is that nurseries, for the most part, are small businesses and, as such, should look to developing better small business management techniques before considering purchasing a computer."

While I still stand by this statement, one thing has changed: nurseries are not

so much small businesses any more. A lot of big companies have come onto the scene and it is very likely that many of the little guys simply won't survive much longer. As I said before, I support the little guys, but so many don't want to know about the future - or even about today!

Enter a modern nursery and you will hear all the modern computer jargon: "My Apple has more bits in its RAM, as well as a floppy disk." This is not a story about a male sheep who eats 'pommes' and has spinal problems.

Without all this marvellous, modern buzz-talk, I suspect very few computers would ever be sold. But apart from the fact that computers are such superb status symbols, there are compelling reasons for looking into them. When I wrote the previously mentioned article in 1982, most systems available cost between \$30,000 and \$50,000. Today, better (and smaller) ones cost around \$5000 to \$10,000. The programs have improved out of sight, and despite such absurd pieces of non-English as 'user-friendly', the systems really are easier to use.

Computers offer staggering advantages in terms of information storage, business systems, and also in their ability to collate and re-arrange information fed into them.

For the nursery industry there are five key areas of computer usage: stock control/order processing; landscape plant selection/data; glasshouse environmental control; bookkeeping; and retail inventory/sales. Perhaps it would be prudent to look at each in detail.

Stock control/Order Processing

Computers programmed for order processing will sort your incoming orders into totals of each type of plant, so your staff won't have to get ten different lots of five *Hakea salicifolia* from the paddock. They will also list the stock lines in the order that they are set out in your nursery, so you won't have to go back and forward along your pathways. Assuming your staff doesn't remove plants from a bed without telling the computer; that the staff never steals plants; that stock doesn't die (without telling the computer); and that new potted-on stock is always recorded - then, computers can give you a fair idea of how many hakeas are there at any given time.

While your computer will be a bloody nuisance when it comes to credits for the stock not accepted by the retailer, and a confusing little turkey when it spits out plant names like 'boug scar' (for *Bougain-*



villea 'Scarlet O'Hara'), it can offer you the following benefits:

Statistics: On such matters as how much money each customer spends per month, year, or whatever; total value of sales for each type of plant, and more.

Profitability: Of each plant grown. If you feed into the computer time taken to grow, number per square metre, sale price, cost of raw materials and labour, and so on, this enables you to decide whether it is worthwhile growing climbers or poinsettias.

Preparation of monthly catalogues: Once the information is fed in, your computer can draw up its own catalogue of available lines, and it will quite happily ignore stock lines where less than, say, 100 units are available for sale.

Production planning: You can record when you propagated your plants, whether they were in flower at the selling time, and other data which will eventually lead to a recipe for the optimum time and methods for producing perfect stock.

General items: If you want it to, the computer can also assist with budgeting,

much of your internal bookkeeping, pricing, invoicing and so on.

Landscape Plant Selection Data

Like it or not, as an industry, nurseries don't use plant material particularly well. Part of the reason for this is the fact that the human brain is not good at selecting plants where many different factors limit the selection. To put this in more concrete terms, let's look at a particular site: the land is located in an industrial area which is prone to pollution, the soils are heavy clay, the site is frost-prone, drainage is poor, the area is subject to strong winds, and short-term flooding is common. The client wants only native plants which flower pink or red; he can't stand variegated plants and insists that none of the trees grow more than eight metres.

How many plants can you list for the site?

A computer can, in seconds, list all available plants which fit every one of those categories; few people could manage to carry out the task in less than several hours (if at all). This sort of program is available from Arbodata, and the

machinery which comes with the package can print out all the relevant plant details, as well as display them on a TV screen. The program includes a dazzling array of information about plants, propagation and maintenance, including ornamental aspects of flowers, fruit, trunks, foliage, and so on. The computer could also be used for general bookkeeping, office records, or even computer games for the kids.

Glasshouse Environmental Control

You simply don't need this sort of gadgetry unless you have large, ultra-modern glasshouses with electronically controlled vents, plus air conditioning and general light and climate control. Also, this computer application is much more sensible for use with large numbers of glasshouses where environment control becomes a bit too complex to handle manually.

Good systems will automatically monitor temperature, outside wind velocity, light intensity, day length, liquid fertilisers, watering, length of time for a crop to grow, and many more aspects. Some computers will phone you at home if the heater breaks down at night or on weekends.

Most of these systems will keep a record of all the above items, so you can look back at the end of a growing season and fine-tune your systems for next year. No human being could monitor all the variables of temperature, light intensity, and so on, over the entire growing period for each crop in this way.

There is no doubt whatsoever that this sort of computer is essential for large-scale growers of indoor plants. The high quality of plants required in the marketplace forces the modern grower to computerise or perish.

Bookkeeping

For a small business, a bookkeeper-cum-clerk is usually far more efficient than a computer, and far more flexible, too. Nonetheless, the computer can calculate reams of figures and statistics which tell you things about your company you never dreamed of. The truth is, often you simply don't need these statistics, anyway — at best they may be a luxury item. The computer is useful when you are dealing with high-volume transactions where the deviations and irregularities are small, or if you need to rearrange your details into complex inter-related charts or lists. The greater the volume of transactions, the better prospect computers become. The major advantage for the small business is that computers force systems upon you. If

A Growing Concern

ARBORDATA is a small company which produces software for landscapers, horticulturalists, nursery owners and keen gardeners. Formed about two years ago, the company is a four-way partnership between Stuart Pittendrigh and Graham Fletcher (both landscape architects and horticultural consultants), Geoff Tomkins (a nurseryman) and Alan Gee (a landscape contractor and computer programmer).

Arbordata's product range centres around a plant database, which can hold 51 items of information on each plant, for up to 2000 plants. The plant profiles include information on growth habit, size and shape of each species, commercial use, maintenance, fertiliser requirements, transplantation details and the tolerance of each species to wind, salt, waterlogging, drought, frost and so on. Since the number of plants which can be held on the database is limited, Arbordata customises the packages designed for commercial use to include the range of plants the nursery owner or landscaper is most likely to use.

The company has so far had an excellent response to its programs, partly because, says Stuart Pittendrigh, "This much information on plants has never before been able to be put on a micro." He says Arbordata succeeded in making this much data available on a microcomputer by using a special programming code — which he is naturally enough somewhat secretive about.

'Plantguide', the program described by Don Burke in the main article, extracts information from this basic database when a nursery owner feeds into the computer various descriptions

of site and desired plant characteristics; by 'sieving' this data the program produces a selection of plants suited to those conditions and conforming to your chosen characteristics. Under prolonged testing Pittendrigh says Plantguide has been found to give significant improvements in both plant selection and plant survival.

The program can also be used to compile a profile of a site, when supplied with the names of plants found growing there. You can also call up details of individual plants from the database.

Plantguide runs on Digital Research's CP/M, CP/M-86 and Concurrent CP/M-86 operating systems, and on Microsoft's MS-DOS. It is available on a leasing basis, under which you pay \$500 the first year, plus so many cents per plant listed, and then just the plant fee every year after that. You can also buy the package straight out, but Arbordata prefers to lease so it can maintain and update the database.

Adding the Admin

'Nursery Record' is a point-of-sale record keeper and stock control package, which also incorporates the plant database and the ability to 'sieve' for suitable plants from Plantguide.



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The point-of-sale facility is designed to act as a printing and record-keeping 'cash register'. When a plant code is entered the system responds with the current price, and then follows the transaction through to the end. At this point it offers four options:

- a) cash taken, no paperwork
- b) cash taken, sales docket produced
- c) account booking made, invoice produced
- d) prints manifest, delivery docket and invoice.

It can also produce details of sales over any given period; details of stock lines which are running out; stock lists; a death and thefts register for taxation purposes; and other categories of information.

Nursery Record can be used to print labels for plants (Arbordata will help you customise these), or to generate supermarket-type labels from which code and batch/line numbers can be read using a light pen.

This system is also available through an annually renewable licence agreement.

Stop Those Arguments

For contractors, Arbordata is currently developing a package called Speedi-Spec, a specification-writing and

compiling package designed to minimise disputes between consultants and contractors. It is divided into trade sections, one of which is landscaping. The landscaping contractor needn't have any particular specification-writing expertise, since the program's database includes the most commonly used information, which the writer slots into a standard sentence structure.

The section for landscapers in Speedi-Spec has over 10,000 writer options arranged under clauses which cover 22 landscaping subdivisions. These include preliminaries, site preparation, fencing, planting containers, playground equipment, grass areas and maintenance.

The program is menu-driven, and once the user has chosen all the elements he or she wishes to include in a particular specification, Speedi-Spec will rearrange these into meaningful sentences, paragraphs and so on. The complete specification may be saved for future reference or editing, or printed out.

If Speedi-Spec generates enough interest, Arbordata will make it commercially available, also on a leasing plan. The cost would include installation by Arbordata, and personalisation of the system so that information

about the user's company or department appears on each printed page.

For the Weekend Gardener

For non-commercial plant lovers Arbordata has just released Plant Pick, incorporating the Plantguide database, which helps you select the right plants for different areas of the garden, and also supplies a wealth of information on individual plants so you can care for them more effectively. Plant Pick costs \$75 and runs on the Microbee.

Arbordata also plans to release another four programs for the home market. These are: Plant Doctor, which will help you diagnose your plants' illnesses - whether they be caused by bugs, diseases or the wrong conditions; Plant Care, which tells you when to prune or otherwise maintain your plants; Plant Minder, which helps you prepare your plants so they can cope while you go on holidays; and Plant Diary, which will organise a whole plant maintenance calendar for your garden. All these programs are designed to run on the Microbee and will cost \$75.

For more information, contact Arbordata at 791 Pennant Hills Road, Carlingford 2118; phone (02) 872 4955.

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you are badly organised, the computer will make you get your act together – but remember, if you organised yourself without the computer, you may well run your business better still.

Computers are fast machines, but they often slow down processes in businesses. For instance, with a good manual system, orders from clients usually reach the despatch area much more quickly. Typical of computer systems is that orders are collected and fed into the computer in a batch, necessitating a delay of some hours before they reach the despatch area. This inflexibility can lead to infuriating delays in many areas.

Computers take things very literally – an account under the name of Smith, John P. could be treated as a separate account from Smith, J.P., leading to an awful mess in your books.

Retail Inventory/Sales

If this sort of program is connected to modern computer terminal cash registers, much of your bookkeeping can be done by the cashiers. For those who have gone into large department stores lately, it need not be pointed out how much this can slow down your service. Keeping a customer waiting while you do your accounts can be a very silly policy. Nonetheless, if the cash registers are used sensibly, the operation can be painless enough, and at the end of each day you can extract a complete breakdown of sales of the various goods categories. If someone can invent a price tag for use

in a nursery which incorporates a product code, one day we could do our stock control through the cash registers. It could well be argued that an electronic cash register can do most of what you want without a computer – so think before you buy.

There is a sound argument in favour of putting your large forward-order seasonal items on a computer: roses, deciduous bare-rooted stock, camellias, azaleas and similar lines are handled particularly well. Day-to-day stock positions calculated by a purchase-to-sales ratio, and general budgeting, are also handled well by computers.

General

Computers don't save time. They don't replace staff. The old claims that 'we have reduced our accounts staff from four to two people' are simply nonsense. What usually happens is the computer forces some of the detailed accounting work out of the accounts office. Staff who work out in the nursery are forced to fill in forms for the computer. It is required of them that they show real discipline and accounting ability, otherwise their work is rejected by the computer. Within the horticulture industry there are many people who love the outdoor life, but who are not overly keen about filling in forms. People outside the accounts area may handle a lot of what was once accounts work, but the risk is that they will do it rather badly.

When you first get your computer,

punching in the details is quite fun. A year or two later it is a boring, repetitive chore. If your staff shows no aptitude for computer work, you may be stuck with the lion's share of the day-to-day work yourself. The computer depends on a large input of information from you each day. Do you have an aptitude for that sort of work? For the first six months, it is generally agreed the computer will be less efficient than your old system; thereafter things get better. Can you wait?

So what do computers do? They enhance your standing in the horticulture community – "I've got a big one too!" you can shout. Computers definitely enable management to make better business decisions based on vastly better information. The extra details, available only through a computer, enable you to make decisions with a precision you never imagined possible. The wretched machine will force you to invent more systems and to record more facts and figures, and this may help your business enormously.

Forecasts, budgeting, cash flow charts, profitability and many complex decisions are turned from being an art into a science.

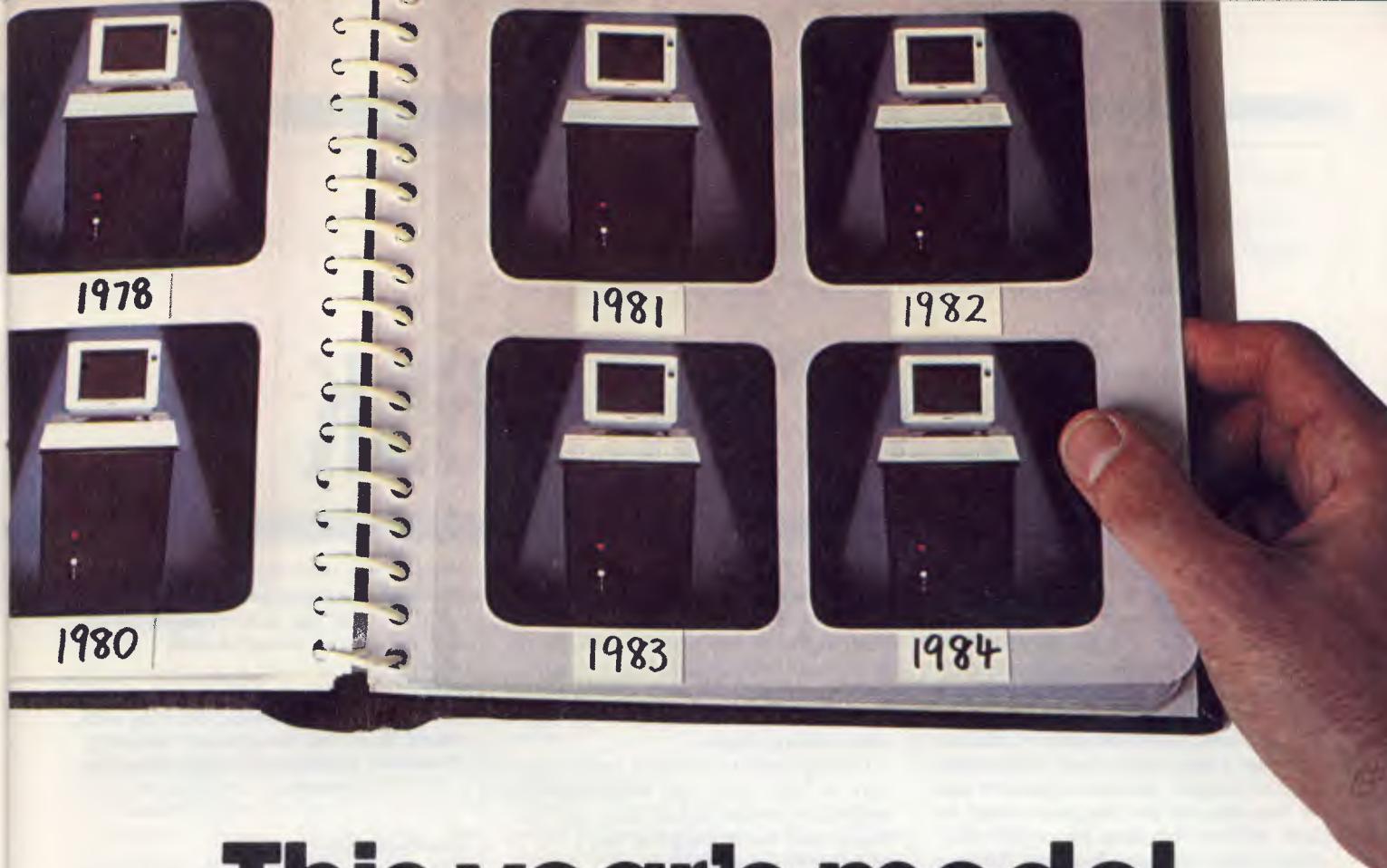
Without a certain volume of work, using a computer parallels buying a sit-on lawn-mower for a pocket-handkerchief front lawn. It is no criticism of the lawn mower to say that it is the wrong machine for the job. Having worked with computers for over ten years, I must say most companies I witnessed which bought a computer bought the wrong type of machine and a crook program. They then spent the next five years trying to make it all work. The modern microcomputer is a vastly better prospect than the old machines, but it is not a panacea – it is a machine with some attached systems, which work in some instances and not at all in others.

Having said all that, you and I both know that *they* know what I have said. The giant computers that watch over all of us have me marked down as a 'subversive'. Needless to say, I will now receive a barrage of new computer junk mail; my Bankcard will be refused over the phone; the wretched phone will be cut off, and my driver's licence will prematurely expire.

But I don't care. What matter wounds! Woe to the Wicked! Pancho, my horse – there are more windmills to tilt ... galoop, galoop, galoop.

Don Burke is known as 'The Lazy Gardener'. He has published a book of that name, writes regularly for 'House and Garden' and has a Sunday morning radio program on 2UE.





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The ELECTRIC DESK

The Electric Desk. Right away, the name of this package grabs you, gives you a clue to what it's like. And, for the most part, it delivers: it has a few minor shortcomings (hopefully soon to be corrected by the vendor), but overall it's a nicely thought-out, well-designed business package which offers four of the most needed business functions. And it's hard to beat the cost per function: divide the cost by five (for four major functions, plus some auxiliary functions such as merge printing and windowing), and the cost for each is a bargain.

Overall View

The Electric Desk combines a spreadsheet, word processor, database processor, and terminal emulator. These days, the whole of business software is often more than the sum of the parts, and so it is with this product. It is designed to allow easy passing of information between functions (which the vendor calls 'services'), and incorporates a simple but effective form of windowing, a partially integrated command structure, and an on-line help tutorial.

With a few keystrokes you can move paragraphs around in a document, automatically log on to a telecomputing service, create a spreadsheet, select and retrieve records from a database, and, in general, accomplish every task you might ask any of the four functions. Three function keys - F7, F8 and F9 - work approximately the same in each service, and the escape key always automatically cancels the most recently-issued command.

Some other good features of this package are a merge printing capability, and provision for macros which will let you redefine lengthy command strings to a single keystroke of your choice.

The Electric Desk will allow you to have open, simultaneously, as many as two communications tasks, nine database

files, nine document files, and nine spreadsheets. This means it's easy to move information between these separate types of documents, and to move swiftly from one to another, taking a spreadsheet from here, database information from there - and cook them up into a delicious data recipe.

Having such power also means users have to keep their wits about them, to remember which documents are currently open or in progress lest a file be inadvertently destroyed.

Screen Display

The screen normally presented to users consists of three parts. At the top is a window displaying the commands for the service that's currently being worked on; the next 19 lines display the active file; and two lines of display at screen-bottom indicate the status of both the current task and other tasks that have been opened. Thus, you know at a glance what service you're in, how many database or spreadsheet files are open, the name of the file currently being worked on, and so on. Once you've developed proficiency with the package, the top three lines - the command menu - can be eliminated, to give you three more lines of display.

Word Processor

The Electric Desk's word processor is of the 'what you see is what you get' variety: if you wish to print text with underlining or boldface, you can display those characters with underlining or boldface on the screen. Text to be printed in super- or sub-script is also displayed on the screen in boldface. Using these 'bells and whistles' is easy: one keystroke brings up a menu, then one (or more) movements of the cursor select the individual option.

Other features commonly demanded of word processors are available, too; such as alignment (right/left justification), page numbering, headers and foot-

ers, centring, 'cut and paste' and so on. Inserting or deleting characters automatically re-aligns the entire paragraph - a nice feature for those who do a lot of editing.

The word processor does not support deleting individual words, deleting individual lines, or wild card searching. Maximum capacity of a single document is 31,743 characters.

Database Service

The database service appears to be quite straightforward: you can create your own database, add, change, and delete existing records, and search a database for records using algebraic expressions (for example, find all records where "ZIP-CODE > 02368" and "PRODUCT = TYPEWRITERS"). Additionally, if you have a smart modem, you can dial phone numbers from the database - a good feature for those who keep their Rolodex on a database.

The capacity of a single database is 50 fields per record, 1000 characters per record (or per field), and 65,000 records per database. The database service supports ascending sorts, but not descending sorts, on multiple fields.

One of the interesting things I found about the database chapter in the manual is that it seemed to assiduously avoid any sort of technical discussion. Although this is in some ways admirable, particularly in terms of not scaring off novice users, the manual could nevertheless stand a bit more technical depth. More on this later.

Spreadsheet Service

The spreadsheet service is also fast and easy to use. Formulas can be constructed using the keyboard or by 'pointing' - moving the cursor around to the particular cell to be worked on - and then using a combination of the <center> key and mathematical operations symbols. There is also full labelling and a full range of mathematical, logical,

No, no, it's not an advanced form of torture to be carried out on underachieving managers. It's a word processor, spreadsheet, database processor and terminal emulator, in one, for the IBM PC. Howard Karten, our US correspondent reviewed it.

BY HOWARD A. KARTEN

financial and statistical functions. Maximum spreadsheet size is 225 rows by 225 columns.

The spreadsheet has all the functions one expects of a good spreadsheet: the ability to copy and edit cells, recalculate, add new rows or columns to existing spreadsheets (and, of course, automatically adjust formulae), adjust cell widths and data displays, and so on.

I should point out that I am not a spreadsheet expert. Nevertheless, the spreadsheet service seemed quite rapid and flexible, and not particularly difficult to learn.

Communications Service

The communications service is similarly straightforward. You can change any of the common parameters (communications speed, number of stop bits, type of parity, and so on), and upload or download to a disk.

In addition, you can customise the communications service via a log-in script. The log-in script contains the telephone number of the service you wish to dial (including the ability, in the US at least, to use one of the AT&T competitors), and instructions to pause the computer (when and as necessary) to allow for ringing signals, transmitting your password and ID, and so on. This feature should be a big help for those who use more than one remote service, and who therefore sometimes inadvertently confuse the proper log-on sequences.

There is, of course, a built-in caution in such a service: anyone who 'borrows' your disk has access to your passwords and other information which should remain confidential.

Auxiliary Features

The fact that this is an integrated package means certain additional features, which are combinations of capabilities offered in each individual service, are available. Foremost among these is the merge printing facility, which works as follows.

You can set up a word processing document to automatically pull in information from the database. For example, if you wish to send customised letters to everyone listed in your database (or in a subset of it), you can set this up to run automatically by following a few simple rules.

Shortcomings

Overall, Electric Desk is a nice package which functions as advertised, but it does have a few weaknesses. None of these are sufficient to recommend against buying the package, but customers and prospective buyers should be well aware of them. The vendor plans to address some of the following weak points in future releases.

1. An attempt to write to a file with a write-protect tab on it may throw you back into DOS. This happened to me twice when I first started testing the program, although I was subsequently unable to reproduce this condition. I urge any user to experiment with this situation, using recoverable data, before they start using Electric Desk in production mode.

2. The communications service does not support simultaneous, optional printing of information being sent over the line. To review what's been sent or received, you must first capture the information on disk, and then print it out. This is a serious drawback for anyone accustomed to going back over a telecommunications session while the session is in progress.

3. There is no way of switching default disk drives after booting up Electric Desk. If you started with drive B as your default drive, you must explicitly address drive A every time you wish to work with data in that drive. This can be a bit of a pain.

4. Although the vendor is obviously quite eager to provide good support to purchasers, this support is still a little rough around the edges. For example,

the vendor's technical support personnel had no knowledge of how to get the communications service to send a break signal (control-P), which breaks off a block being transmitted to the user. The index in the user manual had no entry for either 'break signal' or 'echo', both of which are of some concern to data communications users. I have little doubt that the vendor will rapidly improve in providing user support and assistance.

5. The communications service is set up such that you cannot see what you've actually typed in or uploaded. Although the screen appears to display information from the user's computer, the display is actually information echoed by the remote computer. There are some remote telecomputing services which do not routinely echo information sent by the user, and if you use such a service it will be a problem.

6. Any document prepared by the document service can be transmitted over the phone lines. However, if you transmit to someone else any document which includes underlining, subscripting, boldfacing, and so on, and the receiver does not use Electric Desk, they will have to strip out – manually – the extra embedded control codes.

(This problem occurs with any word processor which uses embedded codes for special print functions. However, with those word processors, it's easier to strip out the extra codes, since they're displayed explicitly. There are clearly two solutions to this problem. Either (a) make sure to leave out special text considerations in a file to be transmitted by phone, or (b) run the received text through a filter program to remove all special characters. Another possibility would be for the vendor to include a utility to do the stripping.)

7. You'll have a minor problem if you use two different kinds of printers, such as a dot-matrix for drafts and a letter-quality printer for final work, and if your documents contain any special functions.

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such as underlining or boldfacing.

Switching printers is not necessary if no special printer functions are used in a particular file. However, if they are the package must be recustomised. This requires removing the write-protect tab on the disk, which I regard as having some risk – especially for users with residual computerphobia.

It's not really a big deal; however, users with two printers should ask for a demonstration of how it is done. In fairness, the vendor points out that the Electric Desk procedure for doing this is much simpler than the same procedure on other vendors' software.

On the plus side, the package currently supports eight different printers, and the vendor plans to add others very rapidly in the near future. The vendor seems to be highly oriented towards service, and is quite eager to answer user questions. Users can register with the vendor to receive news of upgrades (which will be sold at special 'upgrade' prices).

The manual is quite readable, with many examples and appendices. Unfortunately, the index to the manual is incomplete, often fails to list items in commonsense ways, and is overly enthusiastic when it comes to avoiding technical terms. This is downright annoying for any user familiar with the terminology particular to each service.

For example, it's possible to put your Rolodex file on an Electric Desk database, and then have your modem automatically dial the number. That's a nice feature. It would have been even better if there were more discussion of this aspect – for example, the fact that the field used for this in the database *must* be labelled 'PHONE'. I was also not terribly enthusiastic about the fact that I had to lead Alpha's technical representative through a discussion of this feature; but as discussed above, the company is highly service oriented and will undoubtedly improve swiftly.

Another example of the manual's deficiencies is in the chapter on the communications service; there is no discussion of smart-vs-dumb modems, break signals, default drives, echoing, or a few other important topics. Nor are these topics represented in the index.

The vendor would also do well, in future issues, to include at least one chapter's worth of technical material. I would like to see a quick summary of capacities, for example.

At present, the appendices include the following: a summary of commands for each service; a summary of spreadsheet functions; a summary of formatting commands; some all-too-sketchy notes

on customising your own version of ED for your printer; and a half-page of information on "changing key buffer size and default screen colours."

The last item is rather weak. The manual says, in part, "... you can also change the default colours Electric Desk uses on a colour monitor by editing the OPTIONS.S file." That's the only explanation of that file! The manual should include detailed information on how to do it, and on subjects such as file naming conventions, amount of memory needed for each service and special characters. Somehow, I don't think readers are as uncurious as Alpha thinks they are.

Learning Electric Desk

Because this package offers so much, users should not expect to sit down after a brief perusal of the manual and start working right away. It will take a bit of practice to get up to speed, but it will be worth the effort.

The manual is of great assistance in this. It is written in a fairly conversational style, which makes for easy reading (I completed it on several legs of a cross-country air trip), and keeps jargon to an absolute minimum. It will also serve as a fairly good introduction to some topics such as merge printing and database concepts.

Recommendation

Electric Desk works as advertised, and with some grace. If none of the minor objections above disturbs you, you can probably go ahead and buy confidently. Since retailers can't be expected to dwell at any length on ED's drawbacks or failings, I recommend the following procedure before buying.

If you're not already familiar, in principle, with the services Electric Desk offers, take an expert along with you when you visit your retailer. Before you actually go, prepare a particularly tough test case, and see whether ED handles it easily and with style. (This method applies to all software, of course, and not only this package.)

The Electric Desk requires a minimum 256K of memory, and DOS 2.0 or higher. It can run on a one- or two-floppy PC (at least one drive must be double-sided), an XT, or a PCjr, and can use either monochrome or colour display. It costs \$465. The vendor, Alpha Software Corp, has its headquarters at 30 B Street, Burlington, Massachusetts, 01803; phone 617-229-2924; telex 466168 @ ALPHA BURL CI. The Australian distributor is Software Corp of Australia, 449 Swanston Street, Melbourne 3000; phone (03) 347 7011. □

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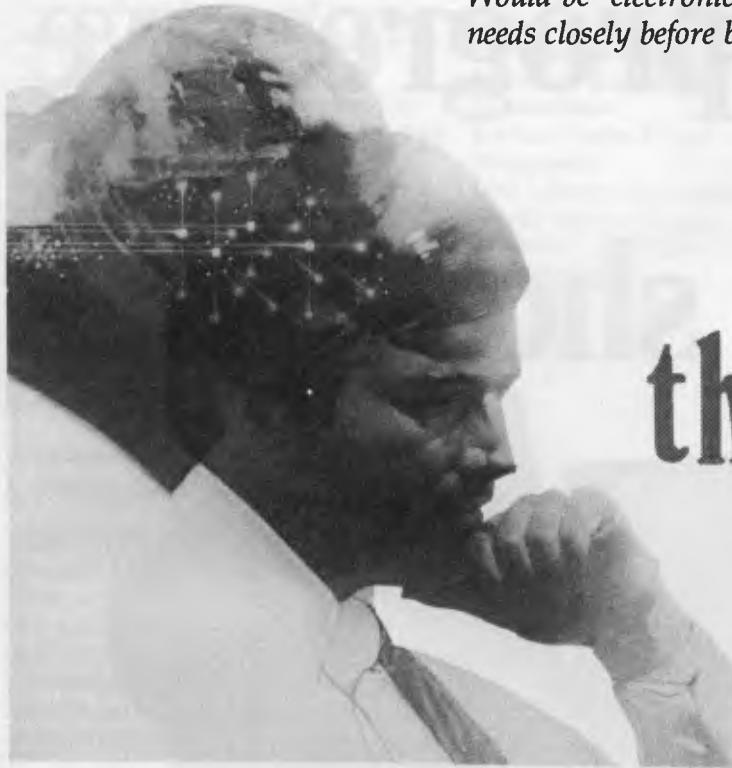
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The 'electronic office' is a term often bandied about by people in the computer industry, and miniaturisation is making the concept look even more attractive as the equipment takes up less space. Would-be 'electronic bosses', however, should still evaluate their needs closely before being persuaded into parting with the dollars.

BY NORMAN KEMP

Fitting Out the Electronic Boss

Ever since the two-way wrist radio that looked so futuristic in Dick Tracey comics became a reality, microelectronics designers have been meeting new challenges in developing miniature and handy-sized devices to equip the well-fitted office executive of the 1980s. Information managers of the Superoffice in the 21st century may consider many of the devices now looked on as state of the art to be clumsy and inefficient by newer standards, and wonder at the depths of human ingenuity and patience needed for mastering the skills to make them work effectively, but in the here and now the array of items usually classed as business or productivity tools continually grows larger, leaving little room on a desktop.

The centrepiece of the 'electronic executive' concept has to be the monolithic workstation or microcomputer, with its ergonomically designed screen poised in open-mouthed gaze. In the not too distant future, the very modern executive might have a voice synthesiser to replace the keyboard, but at present if he or she is a poor-to-moderate typist a touchscreen or mouse device may be used to facilitate data entry.

If space is at a premium, the computer

may be designed with a small 'footprint' – a manufacturer's term to denote maximum space-saving. The Macintosh, for example, is said to have a footprint about the size of a telephone directory. Further compactness has been achieved with some models by reducing the size of floppy disks to 9 cm (3.25 in) – although strictly speaking they aren't 'floppy' any more – which can hold more data than the 20 cm disks of a couple of years ago.

Increased storage capacities for all sizes of disks will be one of the features of microcomputing through the 1980s, leading up to optical disks which can hold very large volumes of easily retrievable information. The Winchester-type hard disk was scarcely known when business micros started arriving on the scene in volume around 1982. There are now about a dozen reliable brands on the market, but users should take to them cautiously: they require skilled installation and implementation, and can create chaos if back-ups are not maintained properly. For many purposes a dual floppy disk system with 256K random access memory – possibly with an internal extension to 512K if there is a substantial workload with spreadsheets – can

suit most single-user applications and requires less knowledge and practice to handle.

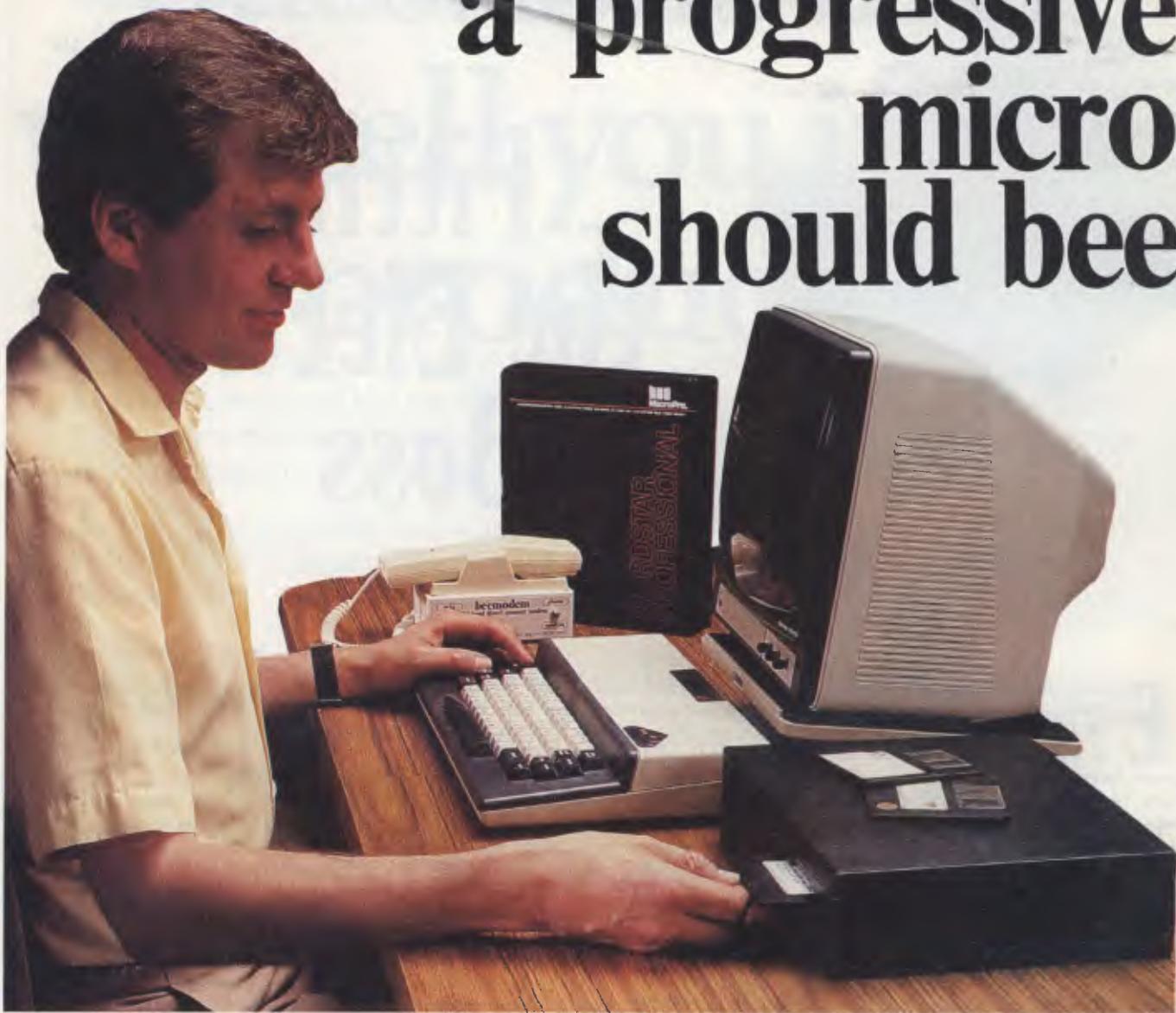
Shrinking Software

Miniaturisation is not easily recognised in software, but it exists in very practical form in financial modelling packages which enable the user to do many of the tasks that once required a mainframe or larger minicomputer. It is true that the capacity for very large-scale number crunching is not present on the average desktop micro, so there are some limits to the manner in which big jobs such as company payrolls or personnel records can be handled. But monthly invoices and statements, retrieval of stock and inventory information, planning manufacturing schedules and estimating large projects are within the capabilities of software packages costing from less than \$1000 to around \$3000 – approximately one-tenth of the cost of similarly designed programs for machines used as recently as five years ago.

The enthusiastic executive may want to phone another user or communicate through a network with other computers. The bulky modem which was an essential part of the electronic office is

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slowly but surely being replaced by built-in devices; one Australian-made unit has been approved by Telecom for Apple and IBM Personal Computers, and a couple more are reportedly on the way.

The ultimate in built-in modems is the type contained in the briefcase, or 'lap' computers, which enables a user to work from a hotel room or, in an emergency, a telephone booth. This facility, is not generally available yet in Australia, but is expected soon. It should be noted that some varieties of these computers need a special jack plug to communicate with hotel switchboards.

The Movable Exec

In the whole area of lap computers there is great potential for development. One example is battery-powered units which can be operated during airline travel — though policy in this matter is subject to review by some carriers and may change. Such machines can be used for running useful, if brief, programs including word processors for memos and letters, and condensed spreadsheets. Dictation and data can also be stored on tape for subsequent office processing. The Convergent Technology Workslate, which

could have been the prototype for a very low-cost version of these units, has been discontinued, but other manufacturers are working on models with similar and improved functions. An incidental but important item for some computers in this category is a battery charger, which should not be overlooked.

For work inside or outside the office, a financial calculator is a handy tool for some executives. Generally these have been thought of as part of the essential equipment of the hacker, who wore one on a belt or an inside-coat-pocket holster, and produced it with the macho flourish of a movie gunslinger. Technical firms such as Hewlett-Packard have extended their range, so that some later and larger models can produce a creditable version of VisiCalc or other spreadsheets, as well as performing more complex calculations such as foreign currency exchanges and fluctuations, and stock and share market profits and losses, even though the devices are low-powered.

Printers are another field in which rapid development has passed largely unnoticed. Earlier, cheap printers tended to produce results that were suitable for little more than the keen amateur, but now for between \$400 and \$600 models are

coming forward which may be said to be leaving a better impression. Daisywheels still outprice dot matrix printers, but the gap is closing, and before long there could be more economical inkjet units on the market. Laser printers, however, will be in the several thousand dollar region for some time ahead, and those that do not produce copies much faster than a conventional office copying machine may find it difficult to justify their existence at any price.

A shopping list for the all-electronic executive could probably add a dozen or more items, and would need super-strength to carry them around. But the pattern for the future of complex and compact devices with even more astonishing power in relation to their size is firmly set. It only remains for the buyer to keep cool, and consider every purchase carefully. Most products will do the tasks claimed for them, but a lot are not upgradable, grow out of date or go out of production prematurely. First, the need must be examined, to assess whether it can be met by traditional methods, and then the product should be meticulously studied to satisfy doubts as to whether it really is an electronic solution. □

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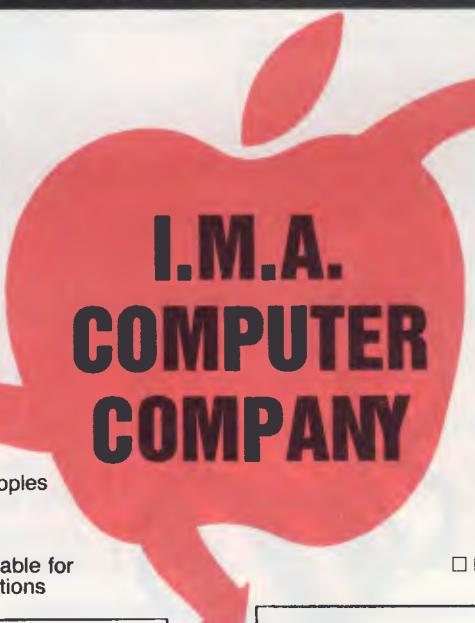
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The video rental business is one of the highest growth industries of the past few years, but also one of the most competitive. As many other small business owners have discovered in the past, in this kind of commercial situation a computer can help to run the business more economically and efficiently.

Steelworkers Take to Home Movies

BY NORMAN KEMP

With the lounge room increasingly taking over from the old picture house that used to draw the Saturday night crowds, video tape rental is a booming business. But it is also very competitive, according to John Walsh, who started a family business near Port Kembla, NSW, 25 years ago and has recently opened a second shop to cope with the growing demand for movie cassettes.

The firm, Walsh's Video Hire, is located in Unanderra, a South Coast residential township thronged at weekends with off-duty steelworkers from the nearby Port Kembla mills, plus a spreading influx of office workers from Wollongong.

For many years, John Walsh handled a television business, assisted by his wife Merle, with his son Ken later adding a sideline in TV aerials; two years ago they set up the video tape hire shop. Now it takes four members of the family, including Ken's wife Diane, to keep the seven-day business rolling smoothly, and an IBM Personal Computer has been acquired to assist with the control of customer records and details of tape transactions, using a software package specially designed for video stores.

The video hire business has about 3500 customers – known as members on its books – and they keep turnover brisk, particularly at weekends. Steelworkers in

their time off, John Walsh mused, like much the same films as the city community. Being a store aimed at the family trade, Walsh's Video Hire only stocks titles which have appeared in cinemas or on TV, and has done well with premium-quality Australian films. 'Phar Lap', 'Man from Snowy River', 'Mad Max', 'Careful He Might Hear You' and 'Gallipoli' have moved readily off the shelves, while favourite titles from American studios have included 'Return of the Jedi', 'The Empire Strikes Back', 'An Officer and a Gentleman' and 'War Games'.

"Australian films can go very well, unless they are made on a shoestring and



then they don't have much appeal," he said. "There are a few requests for cult films such as horror movies, but most people seem to like the commercial tapes which they can watch with their family or a few friends in the living room."

Since Unanderra is barely four miles from the steel plant, it soon feels any shock waves from economic recession or lay-offs of production workers, and during the past two years John says he has had to keep rentals low. "A worker on the dole cannot afford \$5 for a tape, so there have to be cheaper titles he can select from around \$2."

John stocks about 1600 VHS titles in the main store and 700 Beta tapes in the second, smaller shop. Incompatibility of the VHS and Beta systems was the reason for the separate premises, he said. Members with Beta sets became aware as they inspected the shelves that they were getting a limited choice compared with VHS users, but when the two types of tapes were set apart so that they could not be compared there were many fewer complaints.

The computer package Video Track was developed by Berespo Computer Associates of New South Head Road, Edgecliff, in Sydney. The system runs on an IBM-PC with 256K RAM, a 12.5 megabyte hard disk, one 360K floppy disk drive, an IBM 5151 monochrome monitor, and a NEC Pinwriter dot matrix printer. All the products were supplied by IBM's South Coast dealer, Business and Leisure of Wollongong.

To date the computer system is operating in only one of the stores, although the second may be added next year. The main lists on the computer record individual numbers for each member, video title and any cassette copy. New members are asked for two items of identification. "We used to ask for only one," Mr. Walsh said, "but we soon learned how many drivers' licences are 'borrowed'. Even though we ask for two means of identification, we still get an occasional person who will say 'Hang on, I'll get my credit card from the car' - and that is the last we see of him."

Speeding up the System

The computer has considerably speeded up the procedures for borrowing and returning cassettes, he added. There had not been a computer in the business previously, but for video hire with its rapid turnover and fast-changing stock, the method of entering details on cards was too slow, and led to inaccuracies and delays, particularly in keeping check on members who were overdue in returning tapes.

"It took some time at first to get used to the computer, as the program was not written in exactly the same way as the method we had been using," he said. "This also led to some errors, and part of the stock program had to be changed to suit the way the rentals were handled by the shop. The major alteration concerned Sunday, which we term a free day. When we started we were shut on Sunday, so members took their tapes home on Friday or Saturday and returned them on Monday with no extra charge. Although we now do business on Sunday, we still do not charge that day against members who rent tapes for the whole weekend. The computer system initially would not accept that, so a lot of names were listed as owing money for the Sunday when they did not. The problem has now been sorted out by using a coding method that separates each day's transactions more clearly."

In handling the returns and new borrowings, the computer automatically calculates prices and any amounts outstanding. When a member returns a cassette, its number is keyed into the computer, and a 'Returns' display appears showing membership name and identification, as well as the title of the product, date due back, and any deposit held or charges overdue. When the Returns transaction is completed, the membership number is used to display the 'Loans' information, which includes full name, address and phone number, date of last loan, number of times the member has had overdue loans, the number of cassettes being borrowed, and details of each previous loan.

After the cassette number and length of loan have been entered, the computer calculates the sum owing. When this is paid, the amount is recorded and the screen clears for the next transaction.

"Not only is this a virtually foolproof way of running the business, but it is usually accepted without question by our members," Mr. Walsh said. "Until we got the computer, some were inclined to argue about the money, especially if it was owed by them to us. Certainly a few hard cases still argue, but most agree that the computer is accurate - and even if they have forgotten to pay, the computer hasn't. The result is that we have far fewer defaulters with this system."

No Getting away with it

Another advantage of the computer system is its ability to identify money owed by members who place an overdue cassette at the desk without declaring it, in the somewhat blatant hope that it might be overlooked. "But they are not successful," Mr. Walsh said. "The transac-

tion details relating to that cassette are contained in the computer, and we can identify the borrower and know how much is due. When the member returns to borrow another tape, we can present the bill - sometimes much to their surprise."

The system also permits the status of any member to be instantly accessed. This not only reveals payments, but also the number of titles borrowed over a month or other period, and how many are in a member's possession. Similarly, the lending history of any title can be ascertained, which is particularly useful in assessing the popularity of some of the titles to distinguish them from the less profitable items that are languishing on the shelves. It also helps keep track of how many copies have been acquired by the shop for renting and whether there are stocks of the most frequently requested ones available or due for early return.

Through a prior booking arrangement, most titles can be reserved for members, who may also request a video for a specific day, and this can be entered in advance on the computer.

Even tape maintenance has not been overlooked. Tapes deteriorate with constant use, and some are damaged by faulty or neglected equipment. When a tape title is withdrawn, it is listed in a special archive section of the hard disk so that it can be correctly entered for later stocktaking purposes, and its replacement receives a new entry.

At the end of each day's trading the system prints a summary which includes an audit trail recording the number of titles issued, the amount of money paid, and a cash balance which is updated with takings from the start of the month and the year. Entries are included for the Beta tape shop from details compiled when trading ceases. The system is also designed to print renewal notices warning members when their subscriptions are due. On top of all that it produces a master catalogue which is used both as a service and a promotional mailing piece.

Walsh's Video Hire is not the only outlet for cassette tapes in the area. Several have been opened during the past couple of years by former Port Kembla workers who have put their redundancy pay into similar shops. But with their combined experience in the television and rental business covering over a quarter of a century, John Walsh and his family plan to stay ahead of the competition - the computer is a vital tool in maintaining the service and ensuring the foundations for future growth. □



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COMPUTERTIME: FOR TOP VALUE

We haven't seen much of the Compaq computers in Australia as they've only recently started distribution over here, but in the US the company has done creditable battle with IBM in the business desktop market. With the entry of AT&T into this valuable market, Compaq is really going to find itself up against the heavyweights. How will it cope?

BY NORMAN KEMP

Compaq Takes on the Heavyweights

Had Basil Fawlty owned a computer to run his hotel, millions of television viewers might have been denied the bizarre comedy of 'Fawlty Towers'. And the man from Monty Python who invented the Ministry for Silly Walks might have had his peculiar goosestepping ailment caught in time by electronic diagnosis.

When actor John Cleese created those now-famous comic roles he was probably totally unaware of microcomputing. This discrepancy has since been rectified by the makers of the computer of the year in the United States, the Compaq portable, who hired the British comedy star in the unlikely role of presenter for their latest products during July and August. It was part of a \$20 million campaign — with Cleese rumoured to be receiving at least \$100,000 for his appearances with the company that made nearly \$112 million in revenues from its first year's sales of microcomputers — that Compaq felt it needed to swing the public's awareness from corporate image to brand name.

In America such success does not necessarily speak for itself, even coming from a corporation that could justifiably claim it had now developed a full line of 16-bit personal computers which support, without modification, all the popular software programs, memory add-ons and peripheral devices designed for use with the IBM Personal Computer. Although the Compaq Personal Computer is still the flagship of Compaq Computer Corporation, the company has moved into the desktop market, and from the fourth quarter of 1984 will be making



The Compaq Deskpro family consists of the first high-performance 16-bit desktop personal computers to run the Intel 8086 microprocessor while maintaining compatibility with the IBM-PC and XT.

available worldwide four desktop models that will compete even more aggressively against the IBM-PC and XT, and the numerous compatible clones.

Precisely why no Australian distributor picked up the Compaq earlier than May, when it was first announced by Computerland Australia, is something of a mystery. Undoubtedly the huge volume of sales in the United States restricted production for overseas markets, and Compaq has closely guarded its reputation for after-sales service and support through a network of authorised dealers, which could not be guaranteed

in some offshore areas without extensive distribution arrangements. The first break came when Compaq signed with Computerland Corporation, which virtually automatically meant the release of its portable outside the US, and it has since appeared in Britain and Europe as well as in Australia.

Inside Compaq

Compaq Computer Corporation was founded by Ben Rosen, an electronics newsletter publisher and industry analyst who is also a principal in Sevin Rosen Partners Limited, a venture capital firm and the original investor in the corpora-

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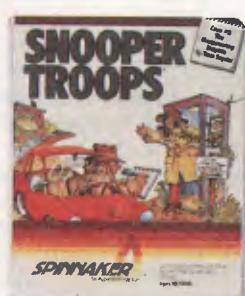
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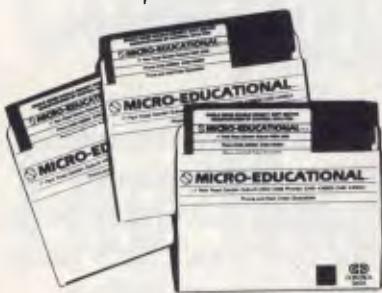
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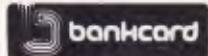
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tion. President and chief executive officer is Rod Canion, who spent 13 years at Texas Instruments before co-founding Compaq in February 1982. The company has eight other vice-presidents and senior executives, most of whom started at the inception and design stages of the first products.

Less than a year after beginning operations, Compaq Computer Corporation, which is based in Boston, Massachusetts, was established as a major force in the personal computer industry. It claimed to have set records in financing and sales, expanded its workforce when other companies were cutting back, and built a corporate organisation designed for further growth. At its founding in February 1982, the company raised a record \$30 million in venture capital, went public in December 1983, and in its first year of operations had revenues of \$111.2 million - the most successful first year of sales ever in American business history. It is currently building new premises on a 20-hectare (50-acre) site, which on completion at the end of this year will contain the Compaq corporate and manufacturing operations over an area of 170,000 square metres (about 500,000 square feet).

The company has three operating sectors - the Portable Computer Division, the Advanced Computer Division and the Office Computer Division. All have new products under development, which will be released during the remainder of 1984 and in 1985. Compaq Telecommunications Corporation, a subsidiary based in Dallas, Texas, is developing advanced communications technologies which will be incorporated in future Compaq products.

Its first model, the portable, was launched in November 1982 after only eleven months in preparation for production. Just nine months later, the Compaq Plus was shipped in late 1983. By early 1984 its products were selling second to the IBM-PC, which has substantially exceeded expectations for the American market.

In 1984, it has added the Compaq Deskpro family of personal computers, which are 16-bit desktop units designed for the Intel 8086 microprocessor, while maintaining compatibility with the IBM-PC and XT. The Deskpro family supports up to four internal mass storage devices protected inside a shock-isolated compartment, and the models are claimed to run at two to three times the speed of standard computers. They include up to six expansion slots and 640K random access memory (RAM) on the system board. Each model is built

around a three-pieced design: a system unit based on the 8086 processor, an 83-key keyboard which fits to the front of the processor, and a 30 cm dual-mode monitor that supports both high-resolution text and graphics on the same screen.

Top of the line is the Model 4, selling in the United States for \$US7195, comprising 640K RAM and three half-height storage devices - a 360K diskette, a 10 megabyte fixed disk drive and a 10 megabyte fixed disk drive back-up. It also includes a full keyboard, asynchronous communications/clock board and four available IBM-compatible expansion slots.

The Model 3, priced at \$US4995, has 256K RAM expandable to 640K, one 360K half-height diskette and a 10 megabyte fixed disk drive with keyboard, monitor, asynchronous communications/clock board and four slots.

The Model 2, which is predicted to be the popular unit and is priced at \$US2995, comprises 256K RAM expandable to 640K, and two 360K diskette drives with keyboard, monitor and six slots.

The basic model is the Model 1, priced at \$US2495, with 128K RAM, single diskette drive, full keyboard, dual-mode monitor and six slots. All models run IBM Personal Computer popular software without modification, and MS-DOS Version 2.0 and Microsoft BASIC are available as options.

Although clearly continuing to be a competitor to the IBM-PC, Compaq may face a vigorous challenge in the United States with the entry of multinational communications conglomerate AT&T into the small business computer market. AT&T's present announced range covers most of the contingencies to counter existing competition, but Compaq has not yet publicly declared its intentions about such forthcoming developments as Unix operating systems, multi-user networking devices, or the more futuristic 32-bit processors.

Some observers in the US believe that the domestic market is becoming saturated with the current generation of 16-bit desktop computers, and that IBM has a clutch of new models to upgrade or supersede its now three-year-old PC before the end of 1985 and during 1986. Compaq has demonstrated it has the initiative and resources to meet the challenges of a turbulent market from start-up, and no doubt will be actively extending its product lines to shield it from the impact of the heavyweights who will be jousting for even greater market shares over coming months. □

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The Apricot – reviewed early in 1984 – has been branching out in the past few months with new models that are gaining good acceptance in the UK and with US software houses. In light of the news that the NSW Government is to buy several million dollars' worth of Apricots, our UK correspondent Martin Hayman went to see what was happening at Applied Computer Techniques, the Apricot's manufacturer.

APRICOT PIPS IBM

ACT'S NEW range, previewed in late June and now being produced at its Glenrothes factory in Scotland, is intended to broaden the company's market base above and below its existing desktop micro Apricot, which features Sony microfloppies and an integral mini-Winchester by Rodime. The new computers are, in essence, two starter machines with single

disks, a portable with full functionality and a flat screen, plus, at the top end, a cluster controller and network server. All models have bundled software at no extra charge, and are 100 per cent compatible with the existing Apricot computer, now known as Apricot PC.

An extra selling point of the Apricot is ACT's recent agreement with the US software firm Lotus Development



to port the new integrated program suite Symphony to its machines. Symphony is tipped to be a winner in the contest to supply one program which contains everything a business user needs during the course of his working day. This strengthens ACT's claim to be the only British firm offering a range of business micros to challenge the increasing dominance of US giants IBM and Apple.

ACT is claiming several world firsts – one is speech recognition, which allows the computer user to instruct the machine through a built-in microphone. Another is the use of a full-sized flat display screen. All machines have 8086 true 16-bit processors, which run MS-DOS or Concurrent CP/M and feature icon and window technology. ACT supplies its own cordless 'mouse', which uses infra-red communication to exchange information with the system box, and may also be used upside-down as a trackball. Keyboards also communicate by an infra-red link, as on the IBM-PCjr (though hopefully with more success!).

For Business and Education

Cheapest of the new machines are the Apricots F1 and F1E, intended for the first-time business user and for education respectively. ACT argues that it is much better for schools and universities to start their students with business-type computers, rather than have to learn new languages and operating systems when they leave school and enter the commercial environment. A fully configured BBC Micro with disk drives costs about the same as ACT's F1E – but the BBC Micro and its BBC BASIC are now so firmly entrenched in British schools that teachers believe it is unlikely ACT will make much of an impression. The story may be different in Australia, where the Acorn-designed BBC Micro might not have effected the whitewash it has done in the UK schools market.

The F1's standard specifications include 256K RAM (F1E, 128K) expandable to 768K, a double-sided 9 cm floppy disk drive from Sony with 720K storage, a cordless infra-red keyboard, a colour monitor driver, and RS232C and Centronics ports. Storage may be expanded via a five-slot expansion box, by adding extra floppies or a 10 Mbyte hard disk supplied by third-party OEMs.

For systems priced to compete with the BBC Micro, now well over two years old, the F1 and F1E offer some notable advantages. Four-colour graphics are displayed to a resolution



of 640 by 256 pixels, 16-colour at 320 by 256 pixels, and they will work with any European television set. This takes out only another 45K because many of the BIOS routines have been implemented in the 32K ROM, leaving the user with 169K (F1) or 41K (F1E) memory. This is much better than the BBC Micro can muster after loading graphics and DOS.

In Britain, the F1 Apricot has Sorcim's SuperCalc, SuperWriter, and SuperPlanner, as well as ACT's own diary, tutorial and graphics user programs. F1E substitutes Personal BASIC and Dr Logo for the Sorcim products, which allows the price to be cut by 795 pounds. Graphics on both machines are said to be compatible with Digital Research's recently revised GSX standard, and F1E can easily be upgraded to full F1 specifications.

Pricier, But Portable

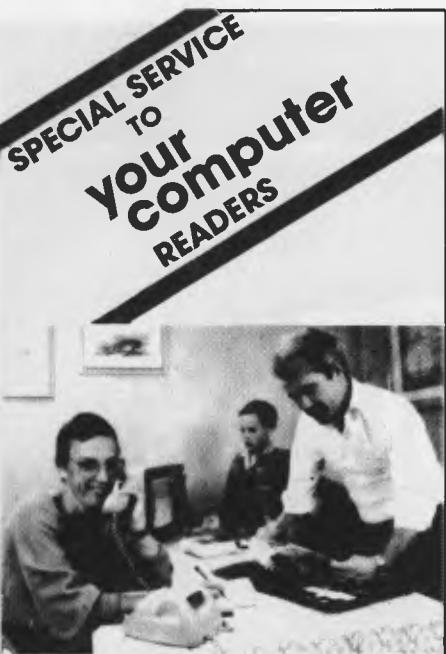
The Apricot Portable, ACT's entry into portable computing, has very similar specifications to the F1 – though its appearance is very different. For the higher price of 1695 pounds you get full portability (at a weight of around 6 kg) and an integral flat screen – ACT is the first company in the world to get stocks of Hitachi's 80 by 25 cm flat LCD screen. ACT's F1 can drive a second, separate colour monitor screen simultaneously, which means you can run calculations on a spreadsheet displayed conventionally on the flat screen, and at the same time display the results as bar charts on the monitor.

The other exciting feature of the Portable is its speech recognition software. A small microphone is attached to the case of the machine, into which the user speaks his own commands. The computer must first

be trained to 'recognise' the way the user pronounces the key words. The software allows users to define their own vocabulary of 4000 or so words, up to 64 of which may be active at any one time. ACT expects this will be especially useful to business people who do not want to type their instructions on the keyboard when using the diary program. An ACT spokesperson suggested this is a more natural way of learning to use a micro than a mouse; as users learn more about the computer they can program their own macro-instructions into one-word commands. The words could, of course, be in any language, making the computer useful in non-English-speaking countries.

Cluster and Network

Two further products were introduced recently, although they are of more



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APRICOT PIPS IBM

interest to companies than individuals. One is a cluster controller which allows six Apricots (all the new computers are compatible) to be linked to one Apricot xi - the 10 Mbyte hard disk version of the original desktop machine. Any of the new Apricot range may be used as a workstation and get access to central data.

The other new product is the Point 32, a network system using Omnitel protocol to link up to 32 Apricots to a 200 Mbyte hard disk, with data security back-up provided by a tape-streamer from the US firm Corvus. With the exception of the Corvus tape back-up, all the products are made in the Glenrothes factory, which ACT says will produce up to 12,000 computers a month by next May.

By the end of June, ACT will have sold 20,000 Apricots, 33 per cent of them going for export. The machine has had a good reception in the US, where the proliferation of IBM clones is beginning to bore computer commentators. Since important US software firms are starting to do ports of their business productivity software to Apricot, its future in the US and all English-speaking territories looks bright. In particular, the F1 is hot competition for Apple's Macintosh - its main memory is greater, its storage capacity is greater (Macintosh has only the single-density Sony microfloppy) and its price is lower.

Not Quite Ripe

When I went to try the new computers, I found some of the claims were a little premature. Much of the software was not fully functional, and ACT only had working prototypes. Some of the infra-red keyboards were not transmitting characters properly, and swift typing in WordStar was not possible. ACT engineers were surprised at the results of my tests in communications because they have put a lot of work into the 32-bit communications protocol with Hamming code error-checking.

The apparent shortcomings may have been due to the fact that the machines offered to journalists had been battered at ACT's enormous launch party at the Royal Albert Hall - where showbiz stars, dancing girls, disco music, and a Star Wars set were laid on to entertain ACT's dealers. Over 200,000 pounds was

spent on the launch party and the company's executives were looking very confident.

Antipodean Apricots

Recent news in Australia is that Barson Computers will be producing Apricot personal computers in New South Wales for Australian and South-East Asian markets. According to a spokesperson for Barson Computers, the plant will be a manufacturing facility, not just an assembly plant; the Australian content of the personal computers will be in excess of 20 per cent.

Apparently, under the three-party agreement signed recently in London by New South Wales Premier Neville Wran, Barson Computers and Applied Computer Techniques, Barson will form two companies. The first, Barson Manufacturing, is expected to commence production before the end of 1984. The second company, Barson Research, is still being formed, but will eventually become the means for technological transfer from Applied Computer Techniques. Barson Research will also carry out research into a number of other projects, including the development of universal communication protocols.

A previously announced contract for ACT to supply TAFE and the NSW Ministry of Agriculture and Fisheries with several million dollars' worth of microcomputers from the Apricot range was tendered for by over 150 manufacturers. The Apricot machines apparently beat their competitors on speed, among other things.

None of these recent developments can have pleased IBM, which had enlisted the assistance of a team from Lotus to help it in its tenders. ACT's gaining the first European 'port' for Lotus's Symphony has been a setback for IBM dealers in the UK, where Apricot enjoys a significant price advantage over the IBM-PC. The recent slide in the pound to a disastrous US\$1.28 will not have improved IBM's pricing, either.

ACT's founder and managing director Roger Foster was amused rather than annoyed at the recent prediction by Apple's boss Steve Jobs that ACT would be crushed by the end of the year. Jobs recently paid a visit to England and heard more about ACT than he liked. In fact, so annoyed did Jobs get about the constant harping on the ACT theme that he has instructed his new UK management team (marketers to the man) to find out whatever they could about ACT. He has good reason to worry. □

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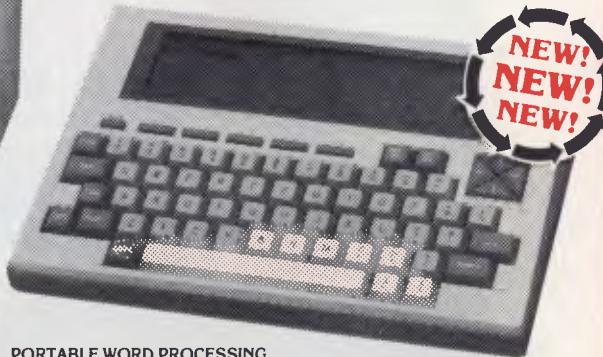
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SPECIFICATIONS

CPU	80C85 (CMOS version of 8085), 2.4 MHz
RAM	16K-byte CMOS RAM (standard) Up to 64K-byte RAM can be mounted in the main unit in 8K-byte segments
ROM	32K-byte CMOS ROM (standard) Up to 64K-byte ROM can be mounted in the main unit
LCD	40 characters x 8 lines 240 x 64 graphic dots. Effective display area: 191.2 (W) x 50.4 (H) mm

NEC PC-8200 SERIES PORTABLE PERSONAL COMPUTER

AS REVIEWED IN 'AUSTRALIAN MICRO COMPUTERWORLD', SEPTEMBER, 1984.



**NEW!
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PORTABLE WORD PROCESSING

The first screen is known as the "MENU". It shows the three programs that are built into the machine. One of these is the program known as "TEXT" which turns the PC-8200 into a word processor. It has the same keyboard as a regular typewriter and an LCD display of 40 characters by 8 lines. Using the standard 16K of memory, the PC-8200 can store approximately four pages of text, making it possible to write and store letters or reports in the computer itself.

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The Personal Application Kit that comes with the PC-8201A is a tape containing fourteen handy programs. They open new applications for your PC-8200. For instance...

LINEAR FORECASTER is a program that can help retailers predict future sales of a given product.

SCHEDULE KEEPER is an electronic agenda.

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Word Length	16 bits
Clock Rate	5 MHz
Arithmetic Processing Unit	Option
ROM Memory*	8K (bootstrap)
RAM Memory	64K chips. 200 ns Access time
Standard Size*	128K bytes
Maximum Size	640K bytes
Memory with Battery Backup*	4K (CMOS) Two-year life Protected against accidental writing

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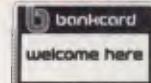
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...other computers cringe

PortaPak comes with its sleeves rolled up. It was designed in Australia to get the most work done in the least time and at the lowest price.

If you want results, sheer computing power, trouble free performance, then PortaPak is the only choice. If you want prestige, if you need to stroke your corporate ego, we suggest you buy something else. Something that costs more, isn't as powerful but has a lot of "image".

Put PortaPak up against imported machines costing \$5000, \$6000 even \$7000. The other machines cringe with embarrassment.

PortaPak has 800K of formatted space on each disk drive. The expensive machines which boast about having 360K suddenly look rather silly. With PortaPak you'll be able to handle much bigger data files and have far more programs on hand without having to fiddle around changing disks.

Reliability is often thought of in terms of machine breakdowns. Nowadays, the big problem isn't with breakdowns it's with hangups - when your machine turns out to be incompatible with your software. This is an enormous, widespread problem.

It's why we teamed up with Australia's software geniuses - Software Source Pty Ltd, the top suppliers of business and professional programs in the country. First, they specially customized PortaPak's operating system so it works with exceptional speed and simplicity.

Then they customized all their CP/M products to run perfectly on the PortaPak - products like dBASE II, SuperCalc, all the major languages, accounting

systems, etc. Most importantly, they stake their reputation that all these products will work without hitches. No other computer in Australia can offer this total software support.

As for electrical and mechanical reliability, look inside a PortaPak. There's a striking difference. The PortaPak is completely modular. We didn't scrimp by putting all the circuits on one board. We use *three*. Servicing is simpler, quicker and cheaper. It's why the leading national computer service company, TCG Pty Ltd, is pleased to offer a 12 month service contract on PortaPak in all capital cities.

Take an extra close look at the Canon disk drives. If Rolls-Royce built computers, they'd use Canon drives. See the massive head protection shield? Hear the way the heads lock away every time they deselect? The designers had an unusual attitude to reliability - fanatical.

Now carry out some speed tests. On a standard benchmark test using BASIC routines*, the timings are: PortaPak 12.9 seconds, IBM PC 16.4 seconds, NEC APC 19.7 seconds and Sirius 16.4 seconds. Using a standard dBASE II routine**, the timings are: PortaPak 8 minutes 11 seconds, IBM PC 11m 52s, Sirius 17m 9s and NEC APC 19m 16s.

The expensive imports really cringe at this because they make so much of being "16-bit" machines. PortaPak is an 8-bit machine and proud of it. Not only is an 8-bit machine inherently better suited to jobs like word processing, accounting, spreadsheets, etc, but the 6MHz clock rate ensures it can run rings around the others even in complicated mathematical tasks.

Now to really rub it in, look at PortaPak's stunning additional features:

- Compact portability. It needs only half the desk space of its nearest rival. It goes with you on business trips, at night, on the weekend. *In one hand, you hold the concentrated working power of an entire office.*
- 9-inch screen, 80-characters wide but with 35 lines instead of 24. You see more of your work and the characters are the normal shape - not elongated. Much more readable.
- 640 x 304 high resolution, dot addressable graphics.
- Free software including Spellbinder word processing and office management system (the most powerful available), EBASIC compiler, MENU to make life easy for new users, MODEM for telephone communications, and Speed Print which lets you continue working while you're printing.
- Universal terminal emulation lets your PortaPak mimic the screen handling of other computers and run the programs installed for them. Your PortaPak can act as a terminal for any computer you care to name.
- Ability to read and write to other 5.25-inch disk formats - e.g. Kaypro and Osborne. Lets you exchange software directly with owners of different computers.
- User definable character set lets you work with foreign alphabets, scientific symbols, etc.
- Five input/output ports for connecting to printers, modems, etc.
- Wide range of peripherals including 5 and 10 Mbyte hard disks, built-in world modem, RAM drive, EPROM programmer, A/D converter, etc.

Radically different, distinctly Australian design using industry standard software.

Two one-megabyte disk drives - total formatted capacity = 1.6Mb.

Z80B processor running at six megahertz.

For the name of your nearest PortaPak dealer contact:
The Portable Computer Co.
80 Beauchamp Rd, Matraville, 2036.
Phone (02) 661 4877. Telex AA71063.
*See Australian Personal Computer, Feb., 1984.
**See Australian Micro Computerworld, Nov., 1983.



9-inch screen, 80 characters by 35 lines
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Entire system including software and sales tax -
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Good students can learn anything. As long as they know their BBC.

Obviously, every student lucky enough to have access to a BBC computer is going to learn about computers.

But that is not the only subject they will have at their fingertips.

For the BBC school computer can enhance virtually any subject on the school curriculum.

Hundreds of educational programmes have been written for the BBC by educators in the U.K.

This material, which is of a singularly high standard, was prepared to achieve a major British Government policy objective of computer literacy in schools.

In addition, a number of State Education Departments in Australia have

written a range of curriculum specific software to plug any cultural gaps.

To simplify the learning process (not to mention the teaching process) the BBC system allows each student in the class to progress at his or her own pace.

Unlike the traditional classroom, no one is held back by the other students or, conversely, left behind.

Even the language of the computer, BBC Basic, is easier to operate so students can begin computer programming much earlier.

In short, the BBC is the computer for learning.

And once again, the British Broadcasting Corporation has helped make the learning process a pleasure.

The BBC school computer.

For more information on the BBC microcomputer and the new compact version, the Electron, send this coupon to: Barson Computers Pty. Ltd.

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BARSON COMPUTERS

PROGRAMMER'S WORKBENCH

Figure 1.
The BASIC version
of the ENV program.

```
100 INPUT "Name of letter file";FS
110 OPEN "I",1,FS
120 LINE INPUT #1,LS
130 WHILE NOT EOF(1) AND LS <> "..address"
140 LINE INPUT #1,LS
150 WEND
160 LINE INPUT #1,LS
170 WHILE LEN(LS) > 0
180 PRINT TAB(30);LS
190 LINE INPUT #1,LS
200 WEND
210 END
```

easy to use. Here's how it works: you type your letter in the usual way, except that just before the recipient's address, you place a line which says '..address'. This will be interpreted as a comment by WordStar, and will therefore not be printed. The only other restriction is that the address must be followed by a blank line.

Then exit from WordStar, or use the R command to run the program, with the command line 'ENV <filename>'. The program then prints the envelope.

Realising that not all our readers have PL/I compilers - which is a pity really, you don't know what you're missing - I've also done a version in BASIC, which should run just fine on Osborne, Kaypro, IBM PC and other machines (though the IBM PC version requires a slightly different OPEN statement).

NEC and the 'IBM Mania'
NEC recently announced its new APC III (what, one wonders, was the APC II?) with a breakfast at Sydney's Pancakes on The Rocks. Interesting was NEC General Manager Graeme Poulton's comments on the PC market.

Perhaps as a hang-over from its earlier APC, which was in virtually no sense IBM PC compatible, NEC has elected to do considerable market research before launching this machine, and has come to the conclusion that it is better not to be totally IBM compatible.

Citing what he described as the media's obsession with the IBM PC, Poulton went on to make the point that the market is still quite open and that users are shopping around on features and making up their own minds on what is the best PC for them, rather than taking the easy way out.

Certainly IBM does not dominate the market here in the same way as it does in the United States (it is interesting to reflect that IBM has recently lost retail market share in the US, going from 21 per cent to 16 per cent). In fact, NEC claims to outsell IBM in Western Australia!

The APC III is an interesting move; it offers considerably higher disk capacity than the IBM PC, and higher screen resolution. Processor performance is also higher. The thing NEC is counting on is that a market exists, comprised of people who understand the significance of this, rather than people who simply want to be able to buy IBM-compatible software off the shelf and run it with minimum fuss.

Certainly, NEC was successful with the original APC, and we foretold its success by telling readers of the

Figure 2. The ENV program in PL/I.

```
env:
  proc options (main);
    dcl infile file,
      prfile file,
      inline char (128) varying;
    open file (infile) stream input title ('$1.$1');
    open file (prfile) stream output print pagesize (0) title ('$LST');
    on endpage (prfile) put file (prfile) page;
    on endfile (infile) stop;

    read file (infile) into (inline);
    call strip (inline);

    do while (inline ~= '..address'||ascii(13)||ascii(10));
      read file (infile) into (inline);
      call strip (inline);
    end;

    read file (infile) into (inline);
    call strip (inline);
    put file (prfile) skip;
    do while (length (inline) ~= 2);
      put file (prfile) edit (inline) (x(30),a);
      read file (infile) into (inline);
      call strip (inline);
    end;

    signal endpage (prfile);

  strip:
    proc (string);
      dcl
        string char (128) varying,
        t char (1),
        i fixed binary (15);

      do i = 1 to length(string);
        t = substr(string,i,1);
        unspec(t) = unspec(t) & '01111111'b;
        if t = 'D' | t = '^S' | t = '^B' then unspec(t) = '00000000'b;
        substr(string,i,1) = t;
      end;

    end strip;
  end env;
```

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BARSON COMPUTERS

PROGRAMMER'S WORKBENCH

significance of its features when it won the Personal Computer of the Year Award two years ago. But today? In Australia — a country of rugged individualists, as the saying goes — NEC has a chance; but in world markets, I'm afraid it's swimming against the tide.

New IBM Software

IBM has released a range of new software which marks its entry into the PC applications market with a vengeance, and is probably the most significant IBM announcement this year.

There are two new series of software: the Business Management Series, which is an accounting package, and the Personal Decision Series, which integrates a number of decision support functions.

The Business Management Series comprises General Ledger, Accounts Payable, Accounts Receivable,

Payroll, Order Entry and Invoicing and Inventory Accounting modules. All support a high degree of functionality: for example, the general ledger supports recurring journal entries based on calculations, for regular interest payments and the like, and maintains the previous year's history for comparative statements.

Perhaps more significant is the fact that all the modules are integrated, so that the Order Entry and Invoicing module, for example, communicates with the Inventory Accounting module. Even more significant is the ability of the system to produce summary files which can be transferred to the Personal Decision Series programs.

These programs constitute a set of integrated software packages, based around a database manager (unlike, say Lotus 1-2-3 or Symphony, which are based around a spreadsheet). There are seven programs in the series, with the 'Data Edition' program

as the central module.

This module provides extensive reporting, query and sorting capabilities, with (for example) five levels of subtotals on sorted data (compare dBase II with only one level). It also provides simple screen and report formatting facilities.

Unusually, for a database management system, this module also includes an asynchronous communications package with data capture facilities. This allows data to be acquired from, say, public database services or other IBM PCs or mainframes.

For advanced reporting, a separate module provides formatting such as headers and footers, print size and colour controls, and adds the ability to extract data from up to six separate Decision Series files. It also includes an application generator, which allows users to generate programs which combine Decision Series screens and reports with BASIC routines.

The Graphs Edition module can create up to 13 types of presentation-quality graphs and charts, including line, surface, pie, bar and scattergrams.

HI-TECH C

An Australian developed C Compiler that runs rings around the opposition.

Features:

- Compiles Full V7 C — including enums and structure operations
- 50%—100% faster code than any competing Compiler
- Complete I/O library
- Source for libraries included — no royalties
- Easy to use — one command compiles, assembles and links
- Powerful debugging tool included
- Command line I/O redirection
- FAST floating point
- Locally developed and supported
- Supports ROM-based software
- Includes MACRO assembler, linker and librarian.

This is a solid production-quality compiler now being used by government departments, major Australian companies and many small companies and individuals. It is available for the Z80 and 8086/8088 processors, running under CP/M-80, CP/M-86 and MS-DOS (or PC-DOS). Whether you are a commercial software developer or a hobbyist wanting to learn the most popular small-system language today, HI-TECH C can provide the answer to your needs.

Benchmark:

Program: Primes (Eratostene's sieve)

	Compiler	Execution Time	Compilation Time	Program Size
HI-TECH C	40	100		4153
Whitesmiths	60	420		15745
C/80	63	140		3584
Aztec	78	144		9168

AVAILABLE FOR:

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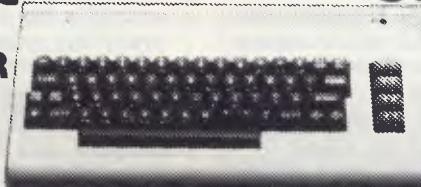
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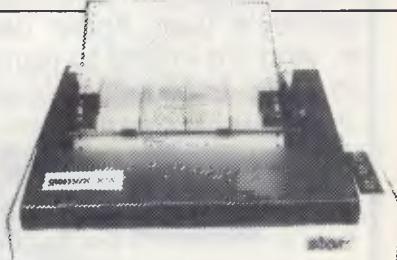
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PROGRAMMER'S WORKBENCH

A word processing package is also available, which boasts the ability to combine text with reports, spreadsheets and graphs from the other modules. It includes all the features one would expect from such a package, including concurrent editing and printing, a variety of print enhancements and a wide range of formatting commands.

Two spreadsheet programs are available: one for \$150, which incorporates most of the features one would expect from a VisiCalc-like package; and a \$300 program which has extra features for consolidation, financial functions, and additional logic and control functions.

Perhaps the most significant parts of the announcement for many corporate users are the 'host attachment' products, as IBM terms them, which allow the Data Edition to communicate with System 36 and 4300, 303X and 308X machines. Attachment/36, for example, links PCs to a System 36 and allows the user to create virtual disks, of up to 10 Mbytes in size, on the 36's mass storage. It also allows PC programs to print on the System/36 printer and vice versa. The hardware required is the 5250 Display Station Emulator Adapter, together with its software.

A similar product is available for comms with mainframes running MVS and VM.

When this new range of software was announced a couple of weeks ago in the US, the share prices for Lotus Corporation and Ashton-Tate plummeted. In fact, the President of Ashton-Tate said "the elephant just rolled over".

The software itself is significant enough, but IBM has also paid attention to training and support with interactive training courses and telephone and newsletter support, plus a low-cost upgrade program. All of these things have been touted around the industry, but IBM is showing the others how it should be done.

Crothers Memorial Computers

Had a pleasant chat with Dr. Harry Garland the other night, while cruising around Sydney Harbour, courtesy of Minicomp. Dr. Garland is President of Cromemco (not Cromenco, as many journalists will insist — it drives me

mad!) Inc., one of the oldest manufacturers of microcomputers in the world and now the largest privately-owned computer manufacturer.

Cromemco's name, by the way, comes from the place where Dr. Garland and his partner, Dr. Roger Melen, passed their student days: Crothers Memorial Hall at Stanford University. The two got their start designing projects for *Popular Electronics* magazine.

As we bobbed around the harbour, we discussed the history of Cromemco, which has chalked up an impressive list of 'firsts': first with high-resolution colour graphics, first with the Z-80 processor, first with a 13 cm disk-based computer, and so on. Today, Cromemco has moved successfully into the supermicro end of the market.

I asked Dr. Garland how he felt about being in a market which is increasingly marketing-driven and less and less technology-driven. He replied that that was one of the good things about the supermicro end of the business — the users are technical, research or similarly oriented, and they are looking for performance, not glossy adverts of IBM compatibility.

Cromemco's machines are increasingly bundled into systems manufactured by OEMs — like the weather-map graphics system which performs animation and titling for United States television weather reports. This is powered by a Cromemco micro which performs graphics manipulations in real time — a very impressive feat.

The future for Cromemco is now inextricably bound up with UNIX, as the company supports UNIX System V on its System 100 and System 300 machines. But Cromemco continues to support its older operating system, CROMIX. I asked Dr. Garland why this was. "CROMIX is ours; we developed it, and since we have the source code, we can have greater control over its capabilities. For example, UNIX is not a real-time operating system, but one of our OEMs required real-time capability. So we modified CROMIX to deliver it."

With the incredible performance of its new machines, the CAD/CAM applications it supports, and the specialised add-ons like a 12 MIPS co-processor, Cromemco seems assured of a rosy future. □

DIARY '85

JANUARY IS the time of year when most people decide to leave even their computers behind in search of more leisurely pursuits. Sand and surf, grassy camping grounds, wet pool sides, pitching yachts, house-shaking parties, piles of good books, long cool drinks – none of these appeal to our glassy-visaged, hard working machines. What we're trying to say is, January is the peak of the summer holidays, so there's not much going on in the computer world. After this month of rejuvenation, however, 1985 is shaping up to be a jam-packed year – so take it easy while you can.

By the way, if you are holding a computer-related event and you want a crowd, or if you belong to a computer user's club we have yet to cover, let the people who collect our event information know. Write to or ring Horan Wall and Walker, The Information Agency, at PO Box 8, Surry Hills 2010. (02) 331 6600.

Wednesday 9 January

The Computer Operations Group of NSW

Here's your chance to mix with the serious end of Sydney commercial computing. This group meets every month to discuss all sorts of topics associated with machines from the big mainframes downwards. The people who show up are mostly from largish organisations – computer operators and shift leader types – people who really know their stuff. The Cricketers Club, Barrack Street, Sydney 2000. (02) 438 1300. 2 pm. Annual fee \$50. Free for the first couple of visits.

Wednesday 9 January

dBase Users' Group Of Victoria

This club meets on the second Wednesday

of every month. It has about 30 members and is always willing to take on more. They use the NEC APC and the IBM PC. January's meeting will concentrate on setting up screen displays under dBase II. Just turn up to the meeting or call Richard Chua for more info on (03) 720-1000. Seminar Centre, 21 Drummond Place, Carlton, Victoria. 6 pm – 9 pm. \$15.

Friday 11 January

Sharp Computer Users' Association

This is the only Sharp computer club in Oz. It has about 160 members, and around 30 turn up for monthly meetings. Members have machines from across the Sharp computer range. The club produces a newsletter, and the membership fee covers a subscription to it. Ring the Secretary Kevin Poynton during business hours for more information. Burwood Heights High School, Mahoney's Road, East Burwood, Victoria. (03) 233 9227. 7 pm 'til late. \$15 per annum.

Monday 21 January

Sydney PC Users

This relatively new group has about 200 members, of whom about 60 show up at regular meetings. It's essentially a club for owners of IBM PCs and compatibles, and is comprised mainly of business users – from one-person shows to large corporations. The Sydney group has access to the 200 public domain programs held by its affiliated PC group in Melbourne. The emphasis for '85, says group member Ian Robinson, will be on communications and electronic mail. Deloittes Haskins and Sells, 8-18 Bent Street, Sydney. (02) 439

5133. Starts at 5.45 pm and costs \$25 per year.

Wednesday 23 January, 1985

Morrow Users' Group

This new club is just getting off the ground and is looking for members – it has about 15 at the moment. The coordinator of the club, Bill Maitland, is hoping to get a newsletter together and assemble a public domain software library. If you have a Morrow and feel like giving Bill a hand, call him or whip along to the meeting. Woodstock Community Hall, Church Street, Burwood, New South Wales. (02) 709 4144. 7.30 pm 'til late. Free for the time being.

Tuesday 29 January

Sydney Macintosh Users' Group

If you have a Mac you'd better join. About 65 per cent of the members are business users, the second largest group is home hobbyists, and then education people. Ron Baxter is the convenor of this new user group. The Computer Shop, 74 Parramatta Road, Annandale, New South Wales. (02) 517 2999. 7 pm – 9.30 pm. \$15 per annum.

And finally ...

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The Portable Computer Company's

PORTAPAK

ABOUT THREE years ago, a colleague of mine and I were window shopping in downtown San Francisco. Pawnbrokers and barbers traditionally indicate their wares by displaying appropriate icons outside the shopfront. There was no mistaking the trade of the particular shop which caught our eye: a large suspended rainbow-striped apple, less a small bite zone. This up-market computer shop was at that time solely into Apples and CP/M-80-based machines, the IBM-PC only just having been announced.

We, true tourist victims that we were, wandered wide-eyed inwards. Traditional fare all, save for a most remarkable thing. Atop a plaster one-metre-high Ionic column sat an Otrona Attache. This elegant small portable was quietly going through its graphics paces, its small high-resolution screen displaying rapid sequences of marvellously drawn views of aircraft and the Space Shuttle. Strange noises issued from its complex sound generator chip, like scent from a flower to the bees. Like bees, we gravitated rapidly to the new attraction.

Does it run WordStar? asked my colleague. Would it handle my medical program? Yes and Yes. Before one could say byte (the well known abbreviation for Buy It), my friend had slapped down his plastic money and became the proud owner of serial No. 0002 Otrona Attache Portable Computer. He's still got it, and it's still doing the things for which he bought it in the first place.

And so it was with a sense of *deja vu* that I came upon the Portable Computer Company's PortaPak while meandering through a recent computer exhibition in Sydney's Centrepoint.

The similarities were there in the general engineering, the way the keyboard acts as a cover, the rectangular flat mono screen, high-resolution graphics, and size. Another classy machine; but this is 1984, not 1981 when the Otrona first appeared. So where are the improvements?

Before addressing that question, let's take a look at the all-Australian company behind the product.

The Matraville-based (Sydney) Portable Computer Company began in mid-1983 as a partnership between a biomedical engineer, Harry Platt, and an electronics engineer, Ivan Stern. Together they created an S100-based machine, the PPC-8. The PortaPak was initially conceived as a workstation for the PPC-8, but it soon became clear that the market for the PortaPak was well ahead of that for the PPC-8. Accordingly, the company incorporated in December 1983, and concentrated on the PortaPak as its main product.

The present staff numbers eleven and it is now ramping up production to meet an expected monthly demand of 100.

The marketing director Steve Townsend told me the company has now signed up eight retail dealers in major capital cities, with an additional six geared for vertical markets. Expansion into suburban retail will probably be the next step.

Perceiving the growing demand for portable machines, the PortaPak designers chose to ignore the current infatuation with 16-bit architecture. Instead, they are relying on the wealth of software currently available under CP/M-80. To get added oomph out of the hardware, they chose the

Z80B CPU chip, which runs at a most respectable 6 MHz. The effect of this is shown in remarkably good benchmark performances (see below). By contrast, the Otrona runs at the regulation 4MHz for its Z80A CPU.

The PortaPak also sports more RAM capacity than the Otrona. Both machines have 64K of user RAM, and both allocate additional RAM for the display. In the case of the Otrona, 4K is set aside for text (and attributes) and another 10K serves to support its bit-mapped 320 by 240 pixel graphics. The PortaPak has an additional 64K of RAM. The video RAM can be assigned under software control to support a full 80 by 35 text screen or a 640 by 304 pixel graphics screen, giving it 250 per cent more resolution than the Otrona. Further, the PortaPak screen is a respectable 23 cm (diagonal measurement) compared to the Otrona's minuscule 14 cm.

Another cute feature is the PortaPak's ability to load a variety of character fonts into a reserved high-speed static RAM. It's rather disconcerting to see the effect of the random contents of this RAM at boot-up time. An AUTO.SUB file contains the command required to load the conventional character set, so the strange screen suddenly becomes meaningful a moment or so later.

A variety of character sets is supplied with the system, including Russian, Japanese, French, and even Old English! There is also a utility (CHRED) which allows you to edit an existing set, or to create new fonts for special purposes.

A key selling feature of the Otrona is its Valet and Charton software. The Valet system provides the busy



Frank Lee reviews a new, all-Australian CP/M portable which runs under CP/M-80 at 6 MHz, and has a full-sized screen, bundled software, two double-head 13 cm disk drives, an elegant appearance ...

executive with a real-time diary and tickler system. I was therefore initially somewhat disappointed to discover that the Portapak has no built-in clock calendar chip, and so can't support such software. On the other hand, I must confess that whenever I have been tempted into using computer-based diaries, it usually becomes a passing fad. There is something decidedly solid and reliable about a conventional paper-based diary which doesn't weigh 11 kg, which doesn't need booting, and which is thoroughly reliable in performance.

Nor is a clock/calendar really necessary unless one is doing real-time process control, or date-time stamping files (which is not supported by plain vanilla CP/M). So I guess I remain ambivalent about its omission from the Portapak. As it happens, there is room for the clock/calendar chip on the main circuit board, and there is suitable software already in the system ROM should a customer require this option. It seems reasonable to omit it from the standard machine.

Because of its additional RAM and bank-switching hardware, the Portapak can be supplied with CP/M 3 (sometimes called CP/M Plus).

The operating system actually supplied with the machine is an enhanced version of CP/M (Version 2.24b).

Software Source, the firm handling system and application software for the machine, has replaced CP/M's normal Console Command Processor (the CCP) with a public domain enhanced version for the Z80 known as ZCPR. I have installed ZCPR myself on the Datamax, and have become so used to it that I get a bit

annoyed when switching back to the conventional CCP on other machines.

While this is not the place to describe ZCPR, here are just a few of its enhancements:

- A TYPE command which pauses at the end of each displayed screen.
- A LIST command to send a file to the LST: device.
- An extended DIR command to allow the display of all system files, or all files.
- The ERA command displays the names of all files it is erasing.
- A vastly improved SUBMIT command.
- SAVE can specify records or pages to save in hexadecimal.
- A new GET command can load a file to a specified memory address.
- A JUMP command 'calls' a subroutine at a specified address.
- A new command search hierarchy which scans all possible disks and

user areas for the required .COM file.

The ZCPR-enhanced operating system is supplied with a number of other public domain utilities which should be familiar to many of our readers. One such is XDIR, the substitute for DIR which presents a neatly formatted directory showing file sizes and space remaining.

Although supplied with a video driver which corresponds to that of a Televideo 920, it is possible to install drivers to emulate other popular terminals. There is a TERMCONF utility for this purpose.

One of the best aspects of this machine is its disk drives. There are two Canon double-head 13 cm drives giving one megabyte of unformatted storage per disk, or 784K formatted. There are utilities for allowing the machine to format, read and write to suit the Kaypro II and single-density Osbornes. No doubt other formats

could also be accommodated.

These drives are beautiful. Not only do they give 80 tracks per side, they are equipped with head-lift solenoids and are delightfully quiet. There is massive magnetic shielding around the head area.

Communication with external devices (printers, modems, and so on) is possible through connectors on the face of the machine (in the spirit of the Osborne). All external connections to the machine (including the power cord) are made via a small panel just to the right of the disk drives. This panel also houses a small fan. A 25-pin RS232 connector offers serial communication at software-selectable baud rates (which can be split if necessary) to support modems and serial printers. A 15-pin connector provides a parallel output to support printers with Centronics protocols. A cable to match the 15-pin connector to the parallel printer is provided.

There is also a 34-pin Peripheral Expansion Interface, providing access to the usual bus signals, plus a simplex serial port.

An external video connector provides composite video, as well as TTL video and separate sync pulses for monitors with these requirements. It is most unlikely a normal user would require an external monitor. It would be neat in a classroom environment, using a large-screen video projector.

The machine specifications also indicate it can run the Corvus network facility under CP/NET.

Options either planned or in development are a hard disk, a built-in modem, a one-megabyte memory drive, an EPROM programmer, a speech synthesiser, a relay driver, a remote mains controller, and a complex sound generator.

Bundled Software

Software Source is the company supporting the PortaPak's bundled software. As a mild departure from tradition, the company supplies Spellbinder instead of the more popular WordStar. I was initially a wee bit disappointed with this decision, mainly because I'm a confirmed WordStar user, and because there is so much support for WordStar from third parties. On the other hand, I actually began word joining with Spellbinder on a Dick Smith Sorcerer. It seems such a long time ago, and very, very different from WordStar. I recall with horror the all too frequent occasions when I forgot whether I was in Command Mode or Edit

Mode, causing havoc as I pounded in commands thinking that they were going in as text.

But then Spellbinder had (has) a lot going for it. In particular, the ability to use proportional spacing wheels correctly was a great plus. So too was the two-column print facility, and the ability to write your own macros. It can also do neat things with dot matrix printers, such as emphasised print and superscripts.

But that was a long time ago. Spellbinder is now up to version 5.3. Mine was around 1.x.

Fortunately, as this is a hardware review, I don't feel compelled to review (let alone re-learn) Spellbinder. Perhaps another day?

Steve Townsend also loaned me a copy of WordStar configured for the PortaPak, and that worked just fine. Funny how a familiar screen can make you feel at home, even if it does have an additional eleven lines.

Another goodie supplied with the system is an accounting package called Ledger/Z by Twiki Pty Ltd. This is a set of programs compiled with BASIC/Z, and for which the run-time interpreter is included.

A program called Menu sets up a .SUB file which then supports a menu-driven shell around CP/M for the 'naive' user. Even the expert user should find this one worthwhile.

'Speed' is a utility which supports powerful printer spooling. In other words, one can start a printout in the normal way, except that the system prompt returns as soon as the file starts to print. One can therefore do more good things while the printer does its thing.

'Modem' is the familiar public domain modem driver, which supports the Christensen protocol for file transfers. It talks to the full-duplex serial port, which must first be configured with the 'Setbaud' utility. The documentation was a little light on how to wire a modem cable to the serial port, but a quick phone call sorted that one out. The next set of documentation will contain much more detail for this important function.

When the machine is first fired up, the serial port is given a default setting of 300 baud, eight bits of data, no parity, and one stop bit. This suits most of us using normal modems and the RBBS systems around town.

EBASIC is also provided (a variant of CBASIC), together with its run-time interpreter.

The software bundle is topped off with a handful of neat things from the

CP/M users' group. Included here are SQ and USQ (squeeze and unsqueeze), useful for archiving text files into just over half their original volume. There are also heaps of games, such as Othello, Life, Adventure (the original), and Aliens (yep, another shoot-em-up Space Invaders). Although the machine is capable of excellent graphics, none of the games make use of this feature.

There were a few pre-release graphics demonstrations, which were quite something. One displayed a dollar bill as captured by a digital camera. Another swung line vectors around the screen creating cute patterns.

Power-off Inspection

The appearance of the unit is impressive. It looks elegant in spite of the front-panel-mounted connectors. The 23 cm screen is covered by a fine black mesh, which gives the impression of a dead-flat rectangular screen. As later tests showed, the mesh really does enhance the contrast without destroying resolution.

The system unit is housed in a heavy-duty aluminium case, 35.5 cm wide, 17.5 cm high and 27.5 cm deep. The detachable keyboard clips over the face of the unit. The adjustable handle serves also to tilt the machine when in use. The complete unit checked in at just over 11 kg on my bathroom scales.

The keyboard surround is smoky plexiglas, giving a hint of the electronics lurking beneath the keys. The keyboard itself is made by Honeywell. The key switches are capacitative and have a good tactile response. A coiled detachable cable links the keyboard to the face of the machine.

A dedicated 'function' key extends the range of the numeric keys (converting them into programmable function keys).

There is no brightness control on the machine as such. Instead, one presses the function key and either the 'comma' key to decrease the brightness, or the 'period' key to increase it. The same idea is used on the Otrona, where it can also be used to vary the sound of the 'bell' and its volume.

The unit is opened for servicing by removing two of the rubber feet,

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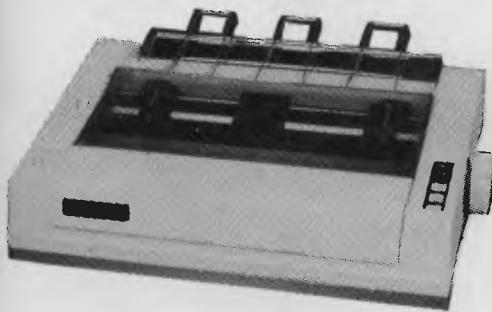
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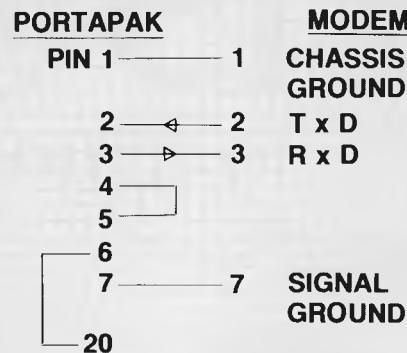
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Figure 1. Portapak to modem wiring.



which are actually moulded over the heads of the retaining screws.

Once the cover is removed, the quality of the Portapak's engineering becomes immediately apparent. This is nice stuff. There is surprisingly little printed circuit real estate, considering the amount of goodies packed within. There is adequate space between component modules for air flow. The power supply looks good and chunky. I imagine the unit would be very easy to service since the logic is contained on three small PC boards which are easily accessed.

Power-on Inspection

Once reassembled and powered up, I was aware of the sound of the machine's cooling fan; noticeable, but certainly not annoying. The disks boot silently; they are possibly the quietest I have ever used. Although 35 lines are crowded onto the 23 cm screen, reading them should pose little difficulty for people with normal sight, or who use reading glasses. The characters are roughly twice the size of newsprint, and are very clear.

A good test of a system (apart from running standard benchmarks) is to run its communications software. To hook the duplex port to a modem, the simplest thing to do is wire up a cable with wires for pins 2 and 3. Pin 7 carries the signal ground, and pin 1 is chassis ground. At the Portapak end, you need to fool it into thinking the modem is there by jumpering pin 4 to pin 5, and pin 20 to pin 6. I use a Dick Smith modem which requires no special jumpering. You therefore need a cable with four wires: two for the ground connections (pins 1 and 7) and two for the data (pins 2 and 3). The wiring is shown in Figure 1.

Since the Portapak boots up at 300 baud, it was no time before I actually managed to log on to the MICC Bulletin Board. It's been so long

since I've been there I couldn't remember my password. Nevertheless, it proved the point.

The version of Modem supplied with the PortaPak has lots of extras not present in the version I normally use. It's labelled version 7.91 dated 11/12/83.

After a little rewiring of the cable at the modem end, Modem's file transfer command was used to send a copy of my favourite PL/I compiler from Harlequin (my Datamax) to the PortaPak. This was later used to do some benchmarking to compare the performance of the Datamax against the PortaPak.

The value of small disks with nearly 800K of storage is just great when using software tools like PL/I. When you add the linkage editor and a copy of WordStar, there's often not much room left for the software you're actually trying to create. With the PortaPak you can develop quite respectable programs on the same disk with the software tools.

Although WordStar is not bundled with the system, it is available. The supplied copy was version 2.26, configured for a standard TTY-like printer on LST: (the parallel port). Since my daisywheel printer behaves like a Qume Sprint 5, it was easy to make the necessary changes to WordStar by running the supplied installation program (WSINSTAL), and nominating the Qume printer from the menu.

The most noticeable difference when using WordStar is the spacious screen. Even with the help menu up, you get a full 24 lines of text. Without the menu, that becomes 33 lines (the top two lines are used for the ruler).

Page scrolling with WordStar could be a little faster, considering the screen is memory mapped, and there is an annoying 'dummy cursor' which traverses the screen as it scrolls. Perhaps a little patching will put that right.

Figure 2 is my version of the popular benchmark program for finding prime numbers. This is the PL/I version of Eratosthenes's Sieve, with the process being repeated 20 times to slow it down sufficiently for stop-watch timing. It is, of course, strictly a CPU-intensive test. Figure 3 gives the timings for the Datamax (using a Z80A at 4 MHz), the PortaPak (a Z80B at 6 MHz) and the Fox 2010M (an 8086 at 4.77 MHz).

According to a brochure published by the Portable Computer Company, the PortaPak also beat the IBM-PC, the NEC APC and a Kaypro IV on a

standard dBase II routine (published in *Australian Micro*, November 1983). This test included considerable disk accessing. The Portapak was said to have a time of eight minutes and eleven seconds, against eleven minutes and 52 seconds for the IBM-PC.

Documentation

The PortaPak User's Guide is supplied in an A5-sized loose-leaf binder. Although this initial release contains only 103 pages, it is quite comprehensive. Like the rest of the manual, the technical section is well written and provides most of the essential information usually sought

by third-party software developers. There is a separate, similarly packaged binder for the Spellbinder system.

The 'Getting Started' section covers the basics of formatting a disk, making back-ups of the supplied system disks, and a brief introduction to the mysteries of CP/M.

The 'Hardware' section uses simple terms to explain the function of the disk drives, main memory, and the keyboard. It describes the 'booting' operation, the use of the monitor, and the various input/output ports.

The 'Software' section explains the mysteries of the ZCPR-enhanced version of CP/M, and the associated utilities. There is a good description

Figure 2. A benchmark program for finding prime numbers.

```

primes:
    proc options(main);
%replace
    size      by      8190;
dcl
    count,
    i;
put skip list('Starting ...');
/* call it 20 times to slow it down for measuring */
    do i=1 to 20;
    call primer;
    end;
put skip list('Number of primes is',count);

primer:
    proc;
dcl
    flags(0:size)  bit,
    i,
    prime,
    k;

count=0;
    do i=0 to size;
    flags(i)='1'b;
    end;

    do i=0 to size;
    if flags(i) then
        do;
        /* found one */
        prime=i+i+3;
        k=i+prime;
        do while (k<=size);
        /* rule out multiples */
        flags(k)='0'b;
        k=k+prime;
        end;
        count=count+1;
        end;
    end;
    end;
end primer;
end primes;

```

REVIEW

PORTAPAK

Figure 3. Speed comparison.

PortaPak	21.7 sec
Datamax	28.0 sec
FOX 2010M	25.3 sec

of the DIRSORT utility which can be used to physically rearrange a disk's directory into alphabetical order. It can also be used to recover lost files.

The dynamic character set definition system is also explained, along with how to use the character font editor (CHRED).

Other packages and utilities covered include Menu (which can be set up as an 'autostart' option), Modem, Seldisk (for using 'foreign' formats), Setbaud, Speed (the print spooler) and Termconf (for replacing screen drivers). A useful addendum is the 'Getting Help' section, which refers the user back to either the Portable Computer Company or to TCG Pty Ltd for after-warranty repairs. TCG has offices in Sydney, Melbourne, Brisbane and Perth.

Apart from the expected contents of a technical manual, the technical section includes an excellent description of ZCPR.

Following detailed documentation for the supplied accounting package Ledger/Z, the manual is rounded off with a glossary and the compulsory list of ASCII codes.

Summary

For a recommended retail prices of \$3555 (including tax) there is no doubt that the PortaPak is good value for money. The enhanced CP/M is excellent, as is the choice of bundled utilities. The high-resolution 35-line screen is easy on the eyes, and there should be no need for an external monitor although the connection has been provided. It has excellent speed (resulting from the use of a Z80B) and large capacity disks.

Although portable, the unit is still not a lightweight. I should like to see a later model featuring battery pack operation, and an ability to switch easily to foreign power supplies (for example, 110 V at 60 Hz). All in all, a first-class machine. Otrona, watch out.

Static

Static electricity is, of course, not restricted to Lotus, but if you use one of the Lotus programs for long periods you may just be unlucky enough to come across it. We struck it recently and were puzzled by it at first. The screen flashed and then went black in exactly the same way as when it is turned off. After this had happened a few times, but only to one particular operator, we cottoned on to what the problem was. The following day we had a parity error as well, with the give-away being that each problem occurred just as this operator sat down and touched the keyboard for the first time.

You can buy a lot of things to overcome static electricity, but some inexpensive solutions are just as good. Try grounding yourself to a metal desk first, use a rubber mat, or just sprinkle some water on the floor.

The moral for all of us is to back up our work frequently. It is all too easy to get carried away with writing a big spreadsheet or entering a lot of figures and only saving it when the job is complete. Saving work doesn't take long and you can write a macro to save and then return you to where you left off.

1-2-3 or Symphony: Which is the Better Buy?

Everybody has different needs, so there can be no clear-cut answer to this question. Even offering advice is difficult, but some guidelines may be of help.

1-2-3 combines three functions in one, but it is first and foremost a spreadsheet. As such, it is no more difficult to learn than a single program, and is probably easier to learn than most. The tutorial is good, the manual, although large, is laid out well and, when used with the on-line help system, provides the answers to just about any question you can think of. The installation instructions are clear, and should present little difficulty to a beginner.

Because Symphony combines five functions, it is much harder to learn. The spreadsheet and graphics functions are similar to those in 1-2-3, but the authors have taken the opportunity to change many operations to make them easier to use or to add versatility. So 1-2-3 users cannot expect to switch and be immediately proficient.

Symphony's tutorial is good, though you must be prepared to devote four hours to going through it all. The

documentation includes three manuals, and this makes it confusing. The introductory manual covers installation in a rather cursory manner, and explains how to start each function. The other two are a large 'How to' manual and an even larger 'Reference' manual. These complement each other rather than duplicate information, so you will most likely have to refer to both and search out what you want to know. A fourth, slim volume is entitled 'Glossary', and not only contains a fine glossary but a 'command tree' for each function (see below), and a listing of error messages, which is far from complete and hence not particularly useful.

Symphony is versatile in that it can be adapted to work with a large range of hardware, but this makes the installation complex, and I doubt that many beginners could handle it. If your dealer will guide you through the installation, this could prevent a lot of headaches. By way of contrast, anyone who has struggled through the tedious task of creating a 1-2-3 macro will be delighted by the more elegant 'learn' mode in Symphony.

Lotus 1-2-3 users with large worksheets could find the size of the Symphony program a problem; Symphony uses about 128K more than 1-2-3. Once you've expanded your RAM to the limit of 640K (excluding RAM disks and print spoolers) there's nothing you can do about it; the program and data must be entirely in RAM.

Like most (all?) new programs Symphony contains bugs, as well as some great new and enhanced features. How important the bugs are and how easy they are to fix remains to be seen.

1-2-3 is a great program and can be recommended without qualification. Symphony costs a little more, offers a good deal more, and is harder to install and learn; once you learn to use it, it should be just as easy to use.

Command Trees

In a menu-based system like that used by Lotus, you make a choice by moving the cursor to the command and typing <enter>, or by typing the initial letter of the command. Frequently, this displays another menu and you keep stepping through it until you find the choice you want. To return, you can press <esc> repeatedly to go back one step at a time, or <Ctrl-break> to cancel the command completely.

Sometimes you may not remember on

which 'branch' of the tree the command you want is. As an extra guide, Lotus supplies a reference guide called command tree. This shows all the menu commands, laid out in such a way that you can follow how to get to each command. This is useful when you are learning the program, and later if you need to find some unfamiliar command.

Add-In Applications

One interesting facility in Symphony goes under the name of add-in applications. You use this to get into the tutorial. On a two-diskette system it's a clumsy procedure, requiring you to load three diskettes in the default drive: the system disk, the Help and Tutorial disk, and the Tutorial disk.

But it is the second add-in application that is most intriguing. This is DOS. You may well ask what is so special about being able to go to the operating system? It's special because you are able to do it without quitting Symphony.

This has some obvious advantages. If you try to save a file to a disk in 1-2-3 and there isn't enough room on the disk to save it, you'll get a 'Disk Full' error message. This is no problem if you have a formatted disk on hand; you simply change disks and repeat the operation. If you don't have a formatted disk on hand, you're in big trouble. In Symphony, you can (in theory) exit to DOS, format a disk, and return to Symphony and proceed with your saving.

I say 'in theory', because although Lotus gives us a list of what it says are the most-used DOS commands, including FORMAT, it omits to say that only the internal DOS commands will be accessible unless you (a) replace the Help and Tutorial disk with one containing the DOS external commands, or (b) copy the DOS external commands you use onto the Help and Tutorial disk. I have the FORMAT and CHKDSK commands on my disk, but you can add others.

Useful as this might be, the real benefit of add-in applications may be that you can exit Symphony and run any program from DOS before re-entering Symphony, provided of course you have enough memory. In this way you may be able to achieve the aim of loading Symphony in the morning and leaving it running all day, while still being able to do any other jobs as they crop up. In my system, the batch file that loads Symphony also adds in DOS, so that it can be 'invoked' at any time. □

HP THINKJET PRINTER

Impressed as we all are with computer technology, we still rely heavily on paper for data storage and communications; and the developers are continually finding more attractive ways of interfacing our new machinery to our old habits. We recently had an HP 2225A Thinkjet printer in the office. Jon Fairall reviewed it for us.

THE HP 2225A Thinkjet printer is the first Hewlett-Packard product aimed at the domestic market (apart from the company's calculators, of course). The good news is that the movement down market has not been accompanied by a lessening of quality.

The first thing you notice about it is that, surprisingly for a printer, the Thinkjet is a good-looking unit. It's clean, neat and very small. In fact, its footprint is barely 290 mm by 205 mm. There are no knobs, bars or levers protruding from it, so it can be pushed into a corner of the desk and conveniently forgotten until you need it.

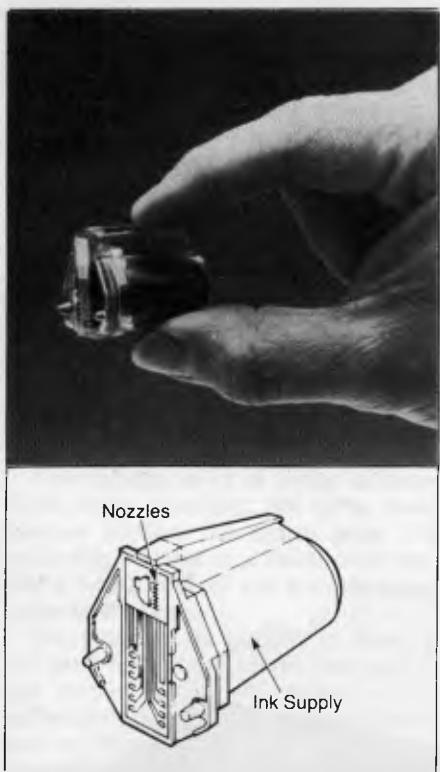
What you don't notice about the Thinkjet printer is the noise it makes – it's quiet. In fact, it's so quiet that, given a moderate amount of noise in the office, the only way to tell whether it's working or not is to watch the paper. Of course, this is what you would expect from a jet; there is no contact at all between the printing mechanism and the paper, so the only sounds are the carriage and paper feed motors doing their chores.

The other thing about it is its speed. The Thinkjet grinds through its load at 150 cps. It's bidirectional, which means the time the printer spends hung up with carriage returns is minimal. Its speed isn't affected by the print mode you select. None of the bold (doublestroke), or underlining modes require a double pass. ▶



REVIEW

HP THINKJET PRINTER



The disposable ink-jet printhead is made up of a liquid ink supply and 12 microscopic nozzles.

Each nozzle can supply a drop of ink on demand from the printer.

The cartridge contains all the parts likely to wear out, so maintenance over and above the regular cartridge changes ought to be minimal.

The Workings

The core of the unit is the removable cartridge which sits atop the print carriage and houses the jets, heater elements and ink bladder. The ink (diethylene glycol) is held under constant pressure in the rubber bladder, from which it is drawn into the jets ready for use. When instructed by the host, current is passed to the heater element. The heater turns on

almost instantaneously, heating the ink in the jet so that it vapourises, creating a bubble. Things are arranged such that a small amount of ink remains unvapourised in the jet, in front of the bubble, and gets forced out onto the paper.

The cartridge contains all the parts likely to wear out plus the ink, so maintenance over and above the regular cartridge changes ought to be minimal. Hewlett-Packard says you should get about 500 pages of text from a single cartridge. This is based on a page of A4 paper completely full of characters, so you could expect much more if you were using it for ordinary correspondence, and less if your applications were graphics orientated. Cartridges cost around \$13.

Looking at the marks left by the Thinkjet through a magnifying glass reveals that the jet puts regular circular blobs on the paper. There is some individual variation, but not enough to detract from the quality of the printing. The result isn't the letter quality you would get from a font printer, like a daisywheel, but it doesn't have the cheap and nasty look you often get from dot matrix printers, either. Assessed on its own terms, the Thinkjet is quite adequate for business correspondence, and more than adequate for home use.

The Thinkjet also has many significant advantages when compared to a daisywheel printer. Apart from speed and quietness, it offers a variety of character and line densities, as well as bold, compressed and expanded print – all features traditionally associated with dot matrix printers. These functions are selected under software control, of course, so you don't need to spend time messing about changing daisywheels or golfballs or ribbons.

The 2225A's graphic mode is selectable from the host computer, using an ESC code. It gives a dot density of 96 dots, both horizontally and vertically, on the default. This can be changed to 182 dots vertical resolution. Graphics data is sent to the printer in groups of one byte at a time, where each group contains data for one horizontal row of dots.

The Printer to Computer Interface

The host computer communicates with the Thinkjet over one of three possible interfaces. HPIL is Hewlett-Packard's version of the IEEE 488 interface, and can be used for communication between any of the company's products and the Thinkjet.

Another version of this is the HPIL, which is also a proprietary interface for talking to other company products – in this case calculators and small handheld computers. HPIL is a looped data stream in which a number of devices can be hooked up in series and identified by unique calling addresses.

The third available interface is a Centronics standard. This is the ordinary parallel interface and allows the Thinkjet to be linked to any computer with a parallel output.

The 2225 has the distinction of being one of the few printers on the market with a lucid, comprehensive manual. It takes you through all the steps necessary for configuring, powering up and testing, there is a useful, easily understood chapter on print features, and another on maintenance and troubleshooting. It contains all the information the typical user is ever likely to need.

Paper

Another feature I liked was the paper feed. The 2225A has no platen, since there is no impact mechanism. The paper is wrapped around two wheels and squeezed against the pinch bar to hold it in place. This arrangement is extremely simple to operate: the paper is inserted behind the roller, and it comes up exactly where it should. If you are accustomed to battling with printers to make them accept paper, this is little short of miraculous.

The only thing I could find wrong with the Thinkjet is its print quality does depend to a certain extent on the quality of the paper being used. In a nutshell – the worse, the better. Because of the print method, and, no doubt, also the speed at which it moves, the Thinkjet depends on the fact that the ink dries almost immediately it hits the paper. This doesn't happen on gloss paper, with the result that the print smears as the head moves over it, and individual dots tend to splatter as they hit the paper.

In such a high quality unit this limitation is a little disappointing, but I don't want to make too much of it. The Thinkjet works perfectly on standard fanfold paper, and HP distributes a special paper for the 2225 which is supposed to take care of the problem. There are also many excellent (and expensive-looking) papers on the market that could be used in place of gloss if required.

At \$795 Hewlett-Packard deserves to have a winner on its hands with this unit. □

Not long ago, it was almost inconceivable that intellectually handicapped people could be employed in making computers. But now, thanks to the work of a concerned parent in pioneering new training techniques, these very people are performing an increasing part of the assembly work on Australia's own Microbee computer.

EMPLOYING THE DISABLED

UNTIL ABOUT twelve years ago, John Leddy was no more interested in the problems of intellectually disabled people than the rest of us. Then something happened: he and his wife discovered that their son Ronnie had just such a disability.

When they looked at the possibilities for Ronnie's education and future employment, they weren't too impressed by what they found. The special schools and sheltered workshops then in existence seemed to reflect a somewhat negative 'look after them and keep them amused' attitude. John Leddy felt there just *had* to be better ways of realising the potential of intellectually disabled people.

Like other parents in the same position, he soon found himself doing voluntary work — but in his case the involvement quickly went a lot further. In 1979 he gave up his job in local government administration and began full-time work in training the intellectually handicapped. Then, in August 1983, he went on a four-month study trip sponsored by Rotary International, visiting all the major US researchers and practical training centres for the disabled.

He came back with two important insights. One was the certain knowledge that even people traditionally classified as 'severely disabled' could indeed be trained to do a lot more. The other was a detailed understanding of the training techniques that could unlock this potential.

Since then he's been putting these insights into practice at the Fairhaven Centre in Point Clare, on the NSW Central Coast. And the results have been very impressive — yet John Leddy stresses he's no 'guru'. "What



Fixing keyswitches to the PC board, Charles Tame shows he can handle a soldering iron with skill and concentration.

we're doing here could easily be done by almost any parent; you don't need any university education. All you need is reasonable intelligence and

the right commitment." And, he might have added, the kind of patience and concern revealed in his own commitment to Fairhaven.

LINGO 128 Vs. THE LOT

You make your own detailed comparison between the Lingo 128, the Cat, the Apple and the Basis Medfly.

When you look at the Cat in Dick Smith's supermarket, you might like to ask whether, when they say it is 95% compatible, do they mean 95% of each programme? Have a look at the August "Your Computer" review!

We have always liked the Medfly, we sold enough of them to know them well! But, when you compare the Lingo against the Medfly, ask whether the Basis Medfly organisation is still manufacturing computers?

So let's compare prices

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Voice synthesizer	35
Amber monitor	220
Custom ROMs	140
Comes with 3 mths. guarantee	
Total	\$2460

Dick Smith's Cat	
As supplied	\$699
Features needed to build to same level as Lingo 128:	
2 disk drives + controller	847
Emulator required to run	
Apple software	99
RF modulator	35
Z80 processor for CP/M	449
Extra 64K memory (approx)	120
Serial adapter RS232C	129
Voice synthesizer	35
Amber monitor	299
Total	\$2712

Apple IIe	
As supplied	\$1650
With 80 column facility RGB color, printer port, single drive, controller, hi-res. monitor, average of quoted prices.	
Extras to bring to same level as Lingo 128:	
Second drive	465
64K card	578
RF modulator	51
Voice synthesizer	35
Total	\$2779

	Lingo 128	Medfly	Cat	Apple IIe
Processor	6502	6502	6502A	6502
Z80 processor for CP/M built-in	YES	YES	NO	NO
RAM memory standard	128K	64K	64K	64K
Enhanced Microsoft Basic	YES	YES	YES	NO
Size of interpreter in ROM	24K	NIL	24K	12K
Numeric keypad	YES	YES	YES	NO
80 column text display built-in	YES	YES	YES	NO
Voice synthesizer included	YES	NO	NO	NO
RGB color output standard	YES	YES	YES	NO
RS232 serial adapter included	YES	YES	NO	NO
Centronics printer port included	YES	YES	YES	NO
Twin drives built-in	YES	NO	NO	NO
Data capacity of each drive	164K	164K	164K	143.5K
Whisper quiet Chimon Japanese drives	YES	NO	NO	NO
Numeric keypad	YES	YES	YES	NO
Separate processor for keypad	YES	YES	YES	NO
RF modulator included	YES	NO	NO	NO
Text card included	YES	NO	N/A	N/A

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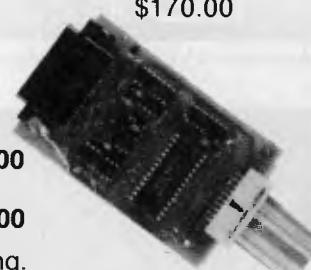
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EMPLOYING THE DISABLED



Debbie Roberts places keyswitches, a task which requires careful alignment of pins on the switch with punched holes on the printed circuit board.

"Look at my work – Value me"

"There is a guy out there," said John, pointing to a worker with an IQ of around 30. "Let's face it, he's no film star to look at, and he can't express himself. But his behaviour says, 'I'm better than you give me credit for'. He can't tell you about what is inside, but he can say, 'Look at my work, value me'."

That expression is the basis of Fairhaven's approach to the severely disabled, based on a belief that the work they produce can be commercially viable. The approach is in its infancy at Fairhaven, but it's being taken seriously enough for the commercial side of the venture to be contributed by no other company than Applied Technology, manufacturer of the Microbee computer.

Between the two organisations a unique relationship is being developed, the result of which is that severely handicapped people have become involved in the manufacture of high-technology components.

When I visited Fairhaven, John Leddy introduced Owen Hill, Managing Director of Applied Technology, Jim Rowe, Managing Editor of *Your*

Computer and myself to his staff. Each person has his or her own workstation, and they were variously engaged in putting on keytops, soldering joints, and rivetting three-terminal voltage-regulator chips to Microbee keyframes.

The thought of mentally disabled people manufacturing computers must stun some people; I for one was sceptical that there was any part of such a high-tech process that they would be able to do properly. The IQ range for the people involved in the scheme is 30 to 60, while the majority of the community has an IQ of well over 90. How could such severely disabled people become involved in the production of the most sophisticated technology known to man?

And yet the work is of exceptional quality. According to John Leddy, the secret is in the training process, and he proved his point by showing us a video of one of the training sessions.

The maximum length of time spent in training is 20 minutes per day. Cathy was in her first session, where she was learning how to put keytops on a Microbee keyboard. She had previously been rated as having an attention span of only 18 seconds, using conventional teaching methods.

As we watched, John Leddy took her hand and reached it into the first

box of letters to pull out a Q. This was compared with a key stuck on the front of the box, both to make sure it was a Q and that it was the right way up. Still holding Cathy's hand with the Q in it, John led her to put the keytop on the keyboard where the Q goes. Then came the next box. All the boxes were laid out in the same pattern as the keyboard, so that Cathy wouldn't have to work out where each key went individually.

After 20 minutes Cathy had put on the QWERTY and ASDF rows, all the while with constant supervision and guidance from John. It would have taken you or I about five minutes to learn and do our first entire keyboard, but Cathy was getting there.

"The learning is slow, but it's happening," according to John. Eventually Cathy will learn the whole process and enter production at perhaps 18 or 20 per cent of the capacity of a non-disabled person – and she will be paid wages for her work on just such a pro rata basis; if she works at 20 per cent of a non-disabled person's rate, she will be paid 20 per cent of a non-disabled wage. This is a significant advance on previous payment approaches for the disabled.

Breaking down the Tasks

At the end of 24 minutes Cathy



Graham Gondolf is employed at Fairhaven, a centre for the disabled, where he solders Microbee keyboards.

EMPLOYING THE DISABLED



Ruth Hutton attaches keytops to switches. The keys are kept in trays which follow the order of the QWERTY keyboard layout.

finished her first training session – 23 minutes and 42 seconds after she was supposed to have lost attention according to 'The System' that had, says John Leddy, "totally devalued her as having any worth."

The learning process Fairhaven adopts can be described in similar terms to the way programmers define problems for a computer. The teacher looks at the job to be done and breaks it into sub-tasks. These are then further broken down until the smallest unit of a task can be understood by the student. The effect is that the main task is defined as a series of smaller, simpler units, each of which is taught to the handicapped person as a small, separate task.

The task we saw Robert Boyle doing was rivetting the three-terminal chip to the keyboard frame. All the average person would see in this task is picking up the washer and putting it with the chip on the frame, then firing a rivet through the right hole. Rob's task was split into fifteen separate sub-tasks: locate three-pin chip, locate washer, locate keyframe, locate three-terminal hole, place washer over hole, align and so on.

The learning process could be scoffed at as an exercise in monkey-see-monkey-do training. But there is one big difference: the rewards for the participants in the scheme are not just tangible, in the form of

wages. The monkey only does things because he wants a banana, but for the workers at Fairhaven the rewards are things which many would not expect them to understand, let alone feel. Their rewards are personal satisfaction at being able to do a job that takes them to the limit of their capabilities and which demonstrates those abilities to others.

This approach to training the disabled was developed in the US, where major companies like IBM have become involved and where the teaching technique has brought some people to the level where they can now assemble entire printed circuit boards. The Fairhaven project has so far been operating for only a few months, but its present successes make John Leddy confident of future progress.

Production is running at 350 keyboards per week, which John thinks could go as high as 500. Applied Technology has approached the scheme as a business relationship first and a charity second. Fairhaven had to tender for the work, and its quote was perfectly compatible with AT's commercial requirements. According to Owen Hill, there were other advantages to having the work done at Fairhaven.

"We have our supplier just down the road," he said (Fairhaven and Applied Tech are about one kilometre

apart), "and we can order in small volumes, say 50 boards at a time, which we can't do with other suppliers."

The Right Quality

Commenting on the quality of the boards, Owen Hill professed himself completely satisfied; he even suggested some of his factory staff could learn a lesson or two from the Fairhaven people about the high quality achievable in the product. "At least they can put the keytops on the right way up, which is more than some of the people at the factory can do!"

The proceeds from the work are being used to develop facilities at Fairhaven so that more people can become involved in the project. As well as the wages paid, there are expenses involved in the project that would not be incurred when employing a non-disabled person, and these too must be brought into the commercial equation.

Communicating Value

The average person's reaction to a severely disabled person tends not to include any expectations of that person being able to perform any useful role in the normal sense. This is partly because it is practically impossible for handicapped people to communicate their value in the conventional sense of social and commercial worth. The striking aspect of the Fairhaven scheme is that these individuals are able to express their value in terms which are not 'special' to their disability; anyone in the modern world can relate to 'work' as an expression of a person's ability and thus come to a better understanding of the people involved.

It is to be hoped that more projects like Fairhaven will start operating in Australia as more people working with the disabled become aware of innovations in other countries and see what is possible. For the moment the benefits are confined to the people at Fairhaven and the owners of Microbee computers. Every time they lay their hands on the keyboard they are in contact not only with a high-tech product, but also with a state-of-the-art approach to the disabled that may help ordinary people to better appreciate the fundamental value of every person, advantaged or disadvantaged.

YOUR OPERATING SYSTEM

By Bill Bolton

ONE OF THE more interesting aspects of working for a major microcomputer software supplier is that I often get loaned machines to evaluate for compatibility with software packages. The aim of most machine suppliers today seems to be IBM PC compatibility, and most of the machines I get to look at are IBM PC compatibles. So how do you go about determining how 'compatible' a computer system is to an IBM PC?

Compatibility has a variety of meanings. I suspect for the average business user it simply means "Can I use the bulk of the software available for the IBM PC" and "Can I use the bulk of IBM PC hardware add-ons with a machine?". While this would seem fairly unambiguous, it still presents problems.

Hardware Compatibility

Hardware compatibility doesn't just mean "will it take IBM PC plug-in boards".

Take for instance the Dick Smith Challenger. Hardly any PC-DOS software uses the programmable interrupt controllers in the PC at all. I'd say at a guess that it's probably only sophisticated PC-DOS communications software that would even think of utilising interrupts. The great bulk of PC-DOS software runs just fine on the Challenger, which would make it seem very IBM PC compatible at a software level.

Unfortunately the programmable interrupt controller in the Challenger is set up for a different mode of handling interrupts from the IBM PC, so as soon as you try to run any software that uses interrupts it falls down badly on compatibility.

Concurrent PC-DOS uses interrupts extensively as part of its multitasking mechanism and so just won't run at all on any of the Challengers I've seen.

Concurrent runs fine on the IBM (naturally) and all the other close compatibles I've looked at, so the Dick Smith Challenger is quite compatible with the IBM PC at one level, yet incompatible at another!

Dick Smith Electronics is aware of the problem with the Challenger and tells me it will be fixed in the future.

PC-DOS Compatibility

The only machine that comes with IBM PC-DOS is the IBM PC. If you buy a close compatible you will get MS-DOS with the machine.

In most cases the MS-DOS im-

plementation will be as close to PC-DOS as the supplier can make it, but it is still not PC-DOS. On several closely compatible machines that I have tested lately I have found some subtle differences between the "our MS-DOS is just like PC-DOS" operating system and real IBM PC-DOS.

This typically shows up in the area of running another copy of COMMAND.COM, and the problem will exist on the closely compatible when running its own MS-DOS, but will not be a problem if the machine is using IBM PC-DOS as the operating system — so it's a software problem, not hardware.

Emtek — A Real Example

I am presently looking at an Emtek closely compatible machine. How do I go about testing it for compatibility? I am, naturally, particularly interested in compatibility of the software packages Arcom Pacific markets, so I spend most time using those on the machine under test. However, I also have a selection of other popular PC-DOS packages and I usually fire those up at least once as well. Finally I have various software tools that I use quite a lot and they also get tested on the machine.

I keep a running set of notes on machine compatibility which get added to as the test progresses. This running list gives some idea of what I look for in terms of compatibility. As you'll see, some of the points are trivial and some important, but they all go in the notes.

The notes are used later to make up any necessary software documentation for Arcom's products on the machine, so even a trivial item can be quite important later when the evaluation is complete and the 'whole picture' on the system under test can be seen.

What follows are my notes on how the Emtek has shaped up so far. The testing isn't complete so please don't take what follows as any sort of recommendation for or against the Emtek PC.

The Hardware

- The manual is not clear on system switch settings. I had to guess what switch settings were needed to get the system to recognise additional memory.
- The additional ENTER key on the numeric keypad is distracting to someone used to the IBM PC keyboard or the keyboard of other closely compatibles. This was particularly a problem with pro-

grams which use the '+' key extensively.

- The transposition of the SHIFT and '/' keys on the left-hand side of the keyboard also took a little getting used to for someone who is used to the IBM PC keyboard.
- The LEDs on the NUM LOCK and CAPS LOCK are handy!
- The disk drives look 'tinny' compared to IBM drives. On several occasions we had to reinsert disks as they were not recognised as formatted disks on the first insertion.
- Plug-in boards for the I/O channel do not have any support at the rear, which could be a bit of a worry with some heavy boards.
- The power-on memory test will usefully test all memory set by the switches on the system board. The test doesn't stop at the first bad memory location like the power-up test of the IBM PC and many of the other closely compatibles I have seen.
- At one stage, before I had figured out the switch settings for the I/O memory, I had a Tecmar 256K memory board in the system. When the system was booted it didn't display anything on the screen, but instead beeped regularly at me. This was obviously supposed to mean something (other than "I don't like what you are doing to me") but the documentation did not cover this event at all.
- The case is secured at the back by five Phillips head screws. In the case of the screw in the middle at the top, there are two Phillips head screws of similar size very close to each other. One screw holds the case on while the other has nothing at all to do with securing the case (as I subsequently discovered). There being no indication of this, I removed the wrong one and puzzled for a while about why the cover wouldn't come off!
- Some commercial IBM printer cables that I had would not fit in the back of the machine correctly. The shell on the DB25 connector was striking the back panel of the machine. These cables presented no problems on an IBM PC though they did present similar problems on some other closely compatibles.
- Both AST 6 Pack and Tecmar 256K memory boards function correctly in the system.
- The floppy disk controller is built onto the main system board rather than being

YOUR OPERATING SYSTEM

a plug-in card. This could present a problem if a user wanted to replace the floppy controller with one capable of handling 20 cm or 9 cm floppy drives in addition to 13 cm drives.

■ The power supply looks quite well made.

The Software

■ Supplied with MS-DOS 2.11.
■ IBM PC-DOS 2.10 boots and runs okay, all utilities appear to run.
■ When the MS-DOS 2.11 supplied with the system is used, Framework recognises three disk drives attached to the system, but fails in any attempt to access the C: drive. Framework will normally attempt to save files on the highest numbered disk it recognises in a system, so under MS-DOS 2.11 it tries to save on the non-existent C: drive, and fails. For Framework this can be changed in the CONFIG.FW file, but a first-time user probably won't have discovered that! When IBM PC-DOS 2.10 is used on the machine, Framework correctly recognises two disk drives at-

tached to the system.

■ When MS-DOS 2.11 is used, the Framework DOS ACCESS command partially works, but very differently from IBM PC-DOS. Instead of the DOS activity taking place within the DOS ACCESS frame, the Framework display disappears and is replaced by a normal DOS screen. Any activity in DOS ACCESS runs at normal speed, which indicates that it is not being captured by Framework. When the EXIT command is typed from DOS ACCESS the Framework screen is restored, but nothing has been captured in the DOS ACCESS frame. Under IBM PC-DOS 2.10, the DOS ACCESS command works correctly.
■ When the MS-DOS 2.11 supplied with the system is used, the RUN command in dBase III reports insufficient memory (in a 576K system) and will not run any external programs. When IBM PC-DOS 2.10 is used under otherwise identical circumstances, the RUN command performs correctly and will run external programs. This inability to run external pro-

grams from dBase III is a serious limitation as it prevents the use of an external editor.

■ Concurrent PC-DOS boots and runs okay, all utilities work.

So Far, So Good

As you can see, the things that I pick up as being important about 'compatibility' from a software supplier's point of view are at least a little different from things you might expect to see in a traditional 'review' of a computer.

From our point of view the Emtek is shaping up as a reasonably close compatible to the IBM PC, especially if you use IBM PC-DOS rather than the supplied MS-DOS.

As I said before, please don't take this as a review of the Emtek – a review would have to cover issues which don't concern me for this evaluation.

PAMS News

There are 10 new systems on the PAMS list this month, a record increase between listings! It seems the PAMS

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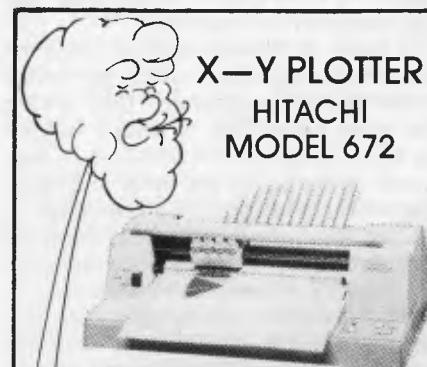
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scene is really hotting up, particularly in Melbourne and Sydney.

HiSoft, IBM's dealer of the year for 1983, has the HiSoft-IBBS system on line as a promotional exercise. From a quick look around it looks very much like the PC-IBBS system and is concentrating on IBM PC matters. Computers Galore has also set up the CG-IBBS system on a similar basis, though it is covering CP/M as well as PC-DOS software.

Mick Stock has the East Ringwood RCPM system on line for restricted hours daily. Mick is hoping to try some of the more recently released RBBS software like SIGNON in the near future.

Meanwhile the SCUA system seems to be having troubles. They advised me of a new number several weeks ago but no one seems to be able to get through to the system. The old number is definitely defunct now so I've dropped them off the list for the time being.

Finally, Philip Westh has put the OMEN IV system on line in Melbourne. This is a TRS-80 based system using Peter McGrath's OMEN software.

Canberra now has an RBBS system; the ACT-RBBS system, on line on a restricted hours basis.

Sydney scores five new systems this month. The Sydney Osborne user group finally has its long-threatened system on line (AUSBD-RCPM), using an ACT hard disk hooked up to a double-density Osborne 1. The system is called the Aboard (ugh!) and Daniel Moran is the SYSOP. The system is open to all callers at the moment, though I gather access will be restricted to members in the future.

Rowan Evan's Oracle RTRS system is now on line for restricted hours. As I do my system checking at night and the Oracle goes to sleep from 1800 to 2400 I haven't logged into it yet!

At last there is an Apple-based BBS system. The Sydney Apple user group has its system up for members, though limited visitor access is available. The software, developed locally by Mathew Barnes and Andrew Riley, appears to run well.

The Sydney Sorcerer user group has a system running on a ring-back basis - you must let the phone ring a couple of times, then hang up and call back within a short time, usually 30 seconds or so. On the second call the computer answers the phone. I haven't been able to get onto this system yet but John Woolner is the SYSOP.

The Texas Instruments user group has its system on line for members for very restricted hours each week. It's too complicated to put in the PAMS list below, so please note the following access times: Monday and Tuesday 1900-

0700, Saturday 1900-2400, Sunday 0900-2400 EST. Shane Anderson is the TISHUG-BBS SYSOP.

The Mi Computer Club RBBS system has been unavailable recently while building work was going on in the Your Computer offices (falling cement and rubble tended to make it unreliable!), but it should be back on line by the time you read this. There is at least one new RCPM system waiting only for Telecom approval to go on line in Sydney. By the time this is published it should have approval, so keep an eye out for announcement of its arrival on your favourite PAMS system.

The latest versions of the AUSTPAMS list, which many of the PAMS systems have available on line, will now show the date of the previous revision (as well as the date of the latest revision) right at the start of the file. This will make it easier for you to see if you have the most recent revision of AUSTPAMS. The on line AUSTPAMS list is the best place to look first for the current status of systems and for the arrival of new systems.

There are now 29 PAMS systems in Australia and one in New Zealand - not bad going considering that only three years ago there were none! □

PAMS Numbers

AUSTRALIA

Software Tools RCPM (S-RCPM)	(07) 378 9530	24 hours EST
Mi Computer Club BBS (MiCC-BBS)	(02) 662 1686	24 hours EST
Micro Design Lab RCPM (MDL-RCPM)	(02) 663 0151	24 hours EST
Sydney Public Access RCPM (SPA-RCPM)	(02) 808 3536	24 hours EST
Omen RTRS (OM-RTRS)	(02) 498 2495	1630-0900 + 24 hours weekends
Sydney TRS-80 UG RTRS (STRUG-RTRS)	(02) 332 2494	24 hours EST
Prophet BBS (PROPHET-BBS)	(02) 628 7030	24 hours EST
Dick Smith Electronics (DSE-BBS)	(02) 887 2276	24 hours EST
Sydney Osborne UG (AUSBD-RCPM)	(02) 95 5377	24 hours EST
Sydney Apple UG (AUG-BBS)	(02) 451 6575	24 hours EST
Sorcerer UG (SUG-RCPM) "Ring Back"	(02) 387 4439	1800-0800 w-days 0800-2400 w-ends EST
Texas Instruments UG (TISHUG-BBS)	(02) 560-0926	See text
Oracle RTRS (ORACLE-RTRS)	(02) 960 3641	0-1800 w-days 0-0800 w-ends EST
Newcastle RCPM (NCLE-RCPM)	(049) 68 5385	1700-0830 + 24 hours weekends EST
Canberra RBBS (ACT-RBBS)	(061) 88 8318	24 hours EST
Melbourne CBBS (MICOM-CBBS)	(03) 762 5088	24 hours EST
TARDIS RCPM (TARDIS-RCPM)	(03) 67 7760	1800-0800 + 24 hours weekends EST
PC Connection IBBS (PCC-IBBS)	(03) 528 3750	24 hours EST
HiSoft IBBS (HISOFT-IBBS)	(03) 799 2001	24 hours EST
Computers Galore IBBS (CG-IBBS)	(03) 561 8479	24 hours EST
East Ringwood RCPM (ERING-RCPM)	(03) 870 4623	1600-2400 daily EST
OMEN IV RTRS (OM4-RTRS)	(03) 846 4034	24 hours EST
Gippsland RCPM (GL-RCPM)	(051) 34 1563	24 hours EST
Gippsland MAIL BUS (GL-MBUS)	(051) 27 7245	24 hours EST
Adelaide Micro UG BBS (AMUG-BBS)	(08) 271 2043	1000-2200 CST
Computer Ventures BBS (CV-BBS)	(08) 255 9146	24 hours CST
Outback RCPM (OUTB-RCPM)	(089) 27 7111	24 hours CST
OMEN II RTRS (OM2-RTRS)	(089) 27 4454	24 hours CST
OMEN III RTRS (OM3-RTRS)	(09) 279 8555	0800-2400 + 24 hours weekends

NEW ZEALAND

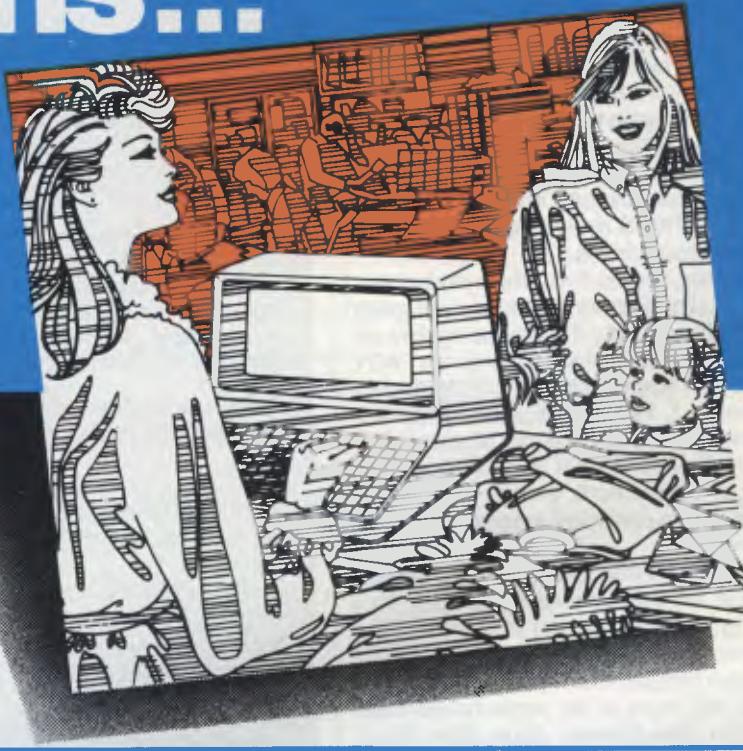
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EXPANDING YOUR IBM-PC

WITH double-sided diskettes, the IBM-PC can hold 320 Kbytes in eight sector format or 360 Kbytes in nine sector format.

These data capacities are based on the use of 48 track per inch diskette drives, as supplied by IBM. Since the release of the IBM-PC,

diskette drive manufacturers have released slimline 96 tpi drives. Not only do these drives have twice the data capacity of the largest IBM drive, they occupy half the volume; so, two fit into one of the IBM diskette drive slots quite neatly (see the photograph over the page). This gives a high-capacity, two-drive



by Peter R. Harris

system and still leaves one drive slot available for expansion to a hard disk system.

Such advanced diskette drives left an obvious niche in the market, which IBM apparently chose not to

address. It was only a matter of time before an enterprising software house provided the necessary programs to effectively support 96 tpi drives.

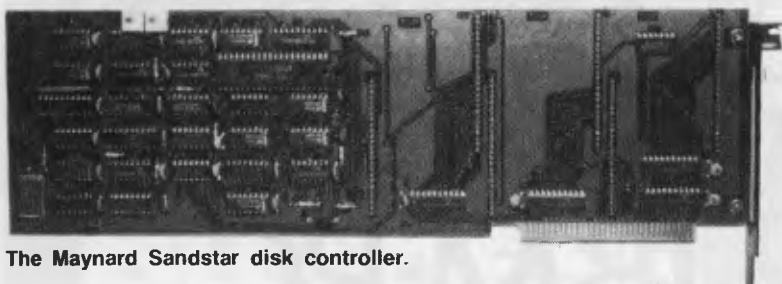
Because of the volume of data I need to hold in my IBM-PC, I decided to acquire a 96 tpi system

as soon as an integrated version became available. When Digital Business Systems and FBN Software, both of Canberra, announced their jointly developed 96 tpi system, I was one of the first to buy one. The components I purchased included two TEAC 55F slimline diskette drives, a Maynard floppy disk controller board,

Table 1. Some of the more common 13 cm drives which may be connected to the Maynard controller.

	Height	Tracks per side	Tracks per inch	Motor speed (rpm)	Transfer rate (kbytes/sec)	Formatted data (kbytes)
Tandon 100-2	Normal	40	48	300	250	360
Tandon 100-4	Normal	80	96	300	250	800
MPI 52	Normal	40	48	300	250	360
MPI 92	Normal	80	96	300	250	800
Teac 55B	Slimline	40	48	300	250	360
Teac 55F	Slimline	80	96	300	250	800
Mitsubishi 4853	Slimline	80	96	300	250	800
Mitsubishi 4854	Slimline	77	96	360	500	1200
Mitsubishi 4855	Slimline	80	96	300	500	1600
Hitachi HFD516A	Slimline	77	96	360	500	1200

EXPANDING YOUR IBM-PC



The Maynard Sandstar disk controller.

HARDWARE REPORT CARD				
Unit:	Sandstar 13 cm/20 cm disk controller			
Made by:	Maynard Electronics			
No. of drives:	Up to four			
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Hardware interface:	Identical to IBM-PC			
Controller IC:	NEC UPD765A			
Data separator IC:	WD1691			
Write precomp:	250 ms			
Extras included:	Cable for two internal drives			
Options:	Up to three I/O modules; choice of serial port, parallel port, clock/calendar and games modules			
Ratings:	Excellent	Very good	Good	Poor
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Table 2 FORMATS HANDLED

	PC-DOS 1.1	PC-DOS 2.0	CP/M-86	Quaddrive	JFormat
48 tpi 8-sector single-sided	Yes	Yes	Yes	Yes	Yes
48 tpi 8-sector double-sided	Yes	Yes	Yes	Yes	Yes
48 tpi 10-sector single-sided	No	No	No	Yes	Yes
48 tpi 10-sector double-sided	No	No	No	Yes	Yes
48 tpi 9-sector single-sided	No	Yes	No	No	Yes
48 tpi 9-sector double-sided	No	Yes	No	No	Yes
96 tpi 8-sector single-sided	No	No	No	Yes	Yes
96 tpi 8-sector double-sided	No	No	No	Yes	Yes
96 tpi 10-sector single-sided	No	No	No	Yes	Yes
96 tpi 10-sector double-sided	No	No	No	Yes	Yes

Table 3 Data Capacities of 512 byte sector diskettes

	Single-sided	Double-sided
8-sector 48 tpi	160K	320K
9-sector 48 tpi	180K	360K
10-sector 48 tpi	200K	400K
8-sector 96 tpi	320K	640K
10-sector 96 tpi	400K	800K
10-sector 96 tpi 500K transfer*	800K	1600K

*Yet to be released

Quaddrive (96 tpi supporting software for CP/M-86) and JFormat (96 tpi supporting software for PC-DOS 2.0).

I should say that the Maynard floppy disk controller board is not absolutely necessary and is only needed for the soon to be released high speed diskette drives with twice the standard transfer rate. Drives such as the Mitsubishi 4855 will again double the capacity of 13 cm drives and provide a massive 1.6 Megabytes of formatted data per drive.

Maynard Controller

The Maynard disk controller (see photograph) is a well-constructed, solder-masked, silk-screened, full-length board with a gold-plated edge connector. Like the IBM controller, it uses the NEC765 diskette controller; but instead of using custom ICs for data separation and write precompensation, it uses the widely available WD1691 chip.

The controller handles up to four diskette drives. These drives may be either standard 13 cm drives with a 250 Kbit/sec clocking rate at double density, or may be 13 cm or 20 cm drives with a 500 Kbit/sec clocking rate.

To test the Maynard controller, I simply removed the IBM disk controller and cables and plugged in the Maynard controller and its cable in its place. I was pleasantly surprised when it worked perfectly with PC-DOS, CP/M-86 and Concurrent CP/M-86. No modifications were necessary to any software.

The Maynard controller provides two facilities over and above that of the IBM-PC disk controller. First, it has provision for the addition of up to three low cost daughter boards which may be any combination of serial, parallel, game and clock/calendar cards. Thus, a disk controller with a parallel printer interface, a serial communications interface and a clock calendar card takes up only one IBM-

PC card slot. The unique mounting arrangement provided allows for two DB25 connectors, connected to IBM specifications, for the parallel and serial interfaces to be mounted on the one board. This is an improvement on other arrangements which require the use of other slot positions for the connectors or leave them suspended on cable.

Second, the board has provision for doubling the clocking rate used for data transfer to and from the disk drives. This was originally provided to support 20 cm diskette drives, for which a termination 50 pin connector is allocated. It is equally suitable for connecting to the new high speed 13 cm drives with a transfer rate of 500 Kbytes/sec. This rate is twice the standard double-density rate of 250 Kbytes per second.

These drives come in two types. The first is functionally identical with 20 cm drives and is hardware and software compatible with these, except that connection is made via 34-wire flat cable instead of a 50-wire cable. As with 13 cm drives, the motors in these drives spin at 360 rpm and there are 77 tracks per side. The second type of drive has 300 rpm motors with 80 tracks per side. A common example is the Mitsubishi 4855 which stores twice the data of a normal 96 tpi drive, which in turn stores twice the data of the standard IBM double-sided double-density drive.

Documentation for the Maynard controller is adequate, though no circuit diagram is supplied. Table 1

The IBM-PC with two TEAC 55F slimline drives installed



lists some of the more common 13 cm drives which may be connected to the Maynard controller, provided appropriate software is used.

TEAC 55F Drives

The diskette drives reviewed were the model 55F. These have 96 tpi and 80 tracks per side; and they run at 300 rpm, with a 250 Kbytes/sec transfer rate at double-density. Storage capacity is 800 Kbytes

in ten sectors (512 bytes) format.

Track to track stepping rate is specified as 3 ms, though I used these drives with CP/M-86 set at a stepping speed of 2 ms track to track without incurring any seek errors. This is a quarter the standard IBM seek time and results in vastly improved diskette accessing. A seek from track 0 to 40 now takes 80 milliseconds rather than the painfully slow 320 milliseconds of the standard unit.

Unlike the IBM drives, the TEAC drives are supplied with a head load solenoid, which only loads the head onto the diskette during reading and writing. No changes were required to the IBM-PC in order to take advantage of the head load solenoid. A brushless DC direct-drive motor requires only 0.3 amps at +12 volts and the circuitry requires 0.55 amps at +5 volts. The 12 volt power consumption is one third that of the old IBM drives and is the lowest of any 13 cm diskette drive I have used.

Unlike many Japanese manufacturers, TEAC has available an optional well-documented maintenance manual of some 206 pages.

The first TEAC drive uses the same mounting holes as the IBM drive. The addition of a second drive requires the insertion of a special mounting bracket. The TEAC drives are slightly longer than the standard IBM drives manufactured by Tandon, but still fit inside the IBM-PC. Note that the edge connector on the TEAC

HARDWARE REPORT CARD

Unit:	Teac 55F diskette drive
Made by:	Teac Corporation, Tokyo, Japan
Track density:	96 tpi
Sides:	Two
Capacity unformatted:	1 Megabyte
Capacity formatted:	800 Kbytes (ten 256K sectors/track)
Track access time:	3 ms (see text)
Motor start time:	400 ms
Head load time:	50 ms
Settling time:	15 ms
Power requirements:	DC +12 V 0.3A typ DC +5 V 0.55A typ
Dimensions:	W — 146 mm, H — 41 mm, D — 203 mm
Weight:	1.5 kg

Ratings:	Excellent	Very good	Good	Poor
Ease of use:	•			
Functionality:	•			
Support:	•			
Documentation:		•		
Value for money:	•			

Extras:	Head load solenoid included
Options:	Maintenance manual
Price:	\$514 incl. tax
Review copy from:	Digital Business Systems, PO Box 33, Rivett 2611. (062) 88-6520.

EXPANDING YOUR IBM-PC

after installation is upside down, as compared with the IBM drive, and requires a rearrangement of the cabling. I used the original IBM cabling when first testing the TEAC drives.

As the TEAC drives record at 96 tracks per inch, instead of the standard 48 tracks per inch, they require the installation of special software to customise both PC-DOS 2.0 and CP/M-86. I used the Quaddrive package for CP/M-86 and JFormat for PC-DOS 2.0.

Quaddrive

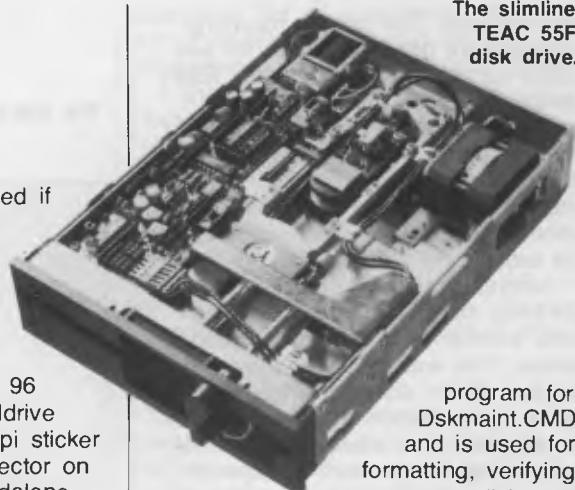
This package is a fine example of software developed by Australian software houses. Quaddrive provides support for high-density disk drives under CP/M-86. Any combination of 48 and/or 96 tpi drives may be used, and the package also supports the ten sector format. The latter increases double-sided diskette capacity under CP/M-86 from 316K to 395K on standard drives, and provides 794K with a 96 tpi drive. When 96 tpi drives are used, the package automatically detects whether a 48 tpi or 96 tpi diskette is in the drive and adjusts CP/M-86 to read the correct format. The CP/M-86 package I use is the version supplied by Digital Research, not the earlier higher priced version still being sold by IBM.

Quaddrive is supplied on a floppy floppy with one side recorded at 48 tpi and the other at 96 tpi. The 48 tpi side is used if you are adding 96 tpi drives to one or more 48 tpi

drives. The 96 tpi side is used if you only have 96 tpi drives available on your IBM-PC. As, by this stage, I had completely removed the old IBM drives and replaced them with the two TEAC-55F drives, I used the 96 tpi side by placing the Quaddrive floppy in drive A (96 tpi sticker facing upwards). The boot sector on the 96 tpi side loads a standalone Quadcopy program. This program reads a 48 tpi diskette and copies it track by track to the first forty tracks of a 96 tpi diskette. Quadcopy will copy single or double density diskettes with eight, nine or ten sectors per track.

I powered up the IBM-PC and copied a 48 tpi CP/M-86 distribution diskette to 96 tpi by following the simple instructions. I then reset with this new diskette in drive A and the product was a basic 96 tpi CP/M-86 system up and running. I then ran Newmaint, the replacement program for Dskmaint, to format a full 80 track per side bootable diskette. Finally, I copied all files from the original Quaddrive diskette to my new 96 tpi diskette, ran SETUP to change the FIDDS allocation to 8K and typed in QUAD to run the system in its final form.

The Quaddrive package consists of three programs. The first program, Quadcopy.CMD, is only required when installing CP/M-86 on an all-96 tpi system for the first time. Newmaint.CMD is a replacement



The slimline TEAC 55F disk drive.

program for Dskmaint.CMD and is used for formatting, verifying and copying diskettes.

Quad.CMD is a field installable device driver program (FIDDS) which takes over the reading and writing of drives from CP/M-86.

Newmaint works in an identical fashion to the Digital Research supplied program Dskmaint, with the same familiar menus. However, after selecting either the 'Format a Single-Sided Diskette' or 'Format a Double-Sided Diskette' options, the user is presented with two format selection screens listing five alternative formats. Thus, combined with side selection on the main menu, a total of ten formats is provided. These formats include 48 tpi ten-sector, 96 tpi ten-sector, 48 tpi eight-sector, 96 tpi nine-sector and 48 tpi eight-sector in a 96 tpi drive. The last format allows for the writing of 48 tpi diskettes on a 96 tpi drive, so the diskette thus created can be read in a 48 tpi drive.

Newmaint can also be initiated with the /S option which automatically copies CPM.SYS and Quad.CMD to the newly formatted diskette. At the same time, CPM.SYS is modified so that the new diskette is bootable in the new format. All formats other than 48 tpi in a 96 tpi drive result in bootable diskettes. Lastly, unlike Dskmaint, Newmaint resets the diskette system when exiting; so the newly formatted diskette is recognised by CP/M-86 without the need to input a Ctrl-C.

Newmaint also provides vastly improved error handling over Dskmaint. Newmaint implements error handling by providing the standard Ignore, Retry and Accept options which are lacking in Dskmaint. With this level of error handling, I found I was able to make a back-up copy of my Microsoft Flight Simulator program by simply ignoring the non-existent tracks during the copy process.

Newmaint allocates 256 directory entries on a 96 tpi double-sided

SOFTWARE REPORT CARD

Package:	Quaddrive			
Made by:	Digital Business Systems and FBN Software			
Useful for:	Increasing the capacity of your 48 tpi CP/M-86 diskettes by 25 per cent and/or handling 96 tpi diskettes			
Hardware required:	IBM-PC with CP/M-86 and 64K memory. A 96 tpi drive is optional but is required for 96 tpi diskettes			
Ratings:	Excellent	Very good	Good	Poor
Documentation:		•		
Ease of use:	•			
Speed:	•			
Functionality:	•			
Support:	•			
Value for money:	•			
Extras included:	Quadcopy			
Price:	\$50			
Review copy from:	Digital Business Systems, PO Box 33, Rivett 2611. (062) 88-6520.			

diskette. The 96 tpi diskette which was created by Quadcopy as the first part of the generation process on an all 96 tpi system does not need a FIDD area allocated in order to run. It simply generates a 96 tpi mirror image copy of the original diskette by using the first 40 tracks on a 96 tpi diskette to copy the entire side of a 48 tpi diskette. Such a diskette in a 96 tpi drive appears to the driving hardware and software to be indistinguishable from a 48 tpi diskette in a 48 tpi drive.

Newmaint and Quaddrive will also format and read ten-sector diskettes on 48 tpi drives. Thus, a 25 per cent improvement can be obtained in data capacity without using 96 tpi drives. I understand a version of Quaddrive is being developed for use with Concurrent CP/M-86.

The CP/M-86 system as set up by Newmaint with the /S option allows for the immediate reading and writing of diskettes in the specified format as created by Newmaint. To provide for the automatic detection, reading and writing of all allowable formats, the field installable device driver (FIDD) Quad.CMD must be initiated. This is done by typing in QUAD, which installs the device drivers and then returns to the CP/M-86 prompt.

The present version of QUAD is restricted to the reading and writing of the formats created by Newmaint. I understand the next version will allow for user-defined formats such as the Kaypro, Osborne and Superbrain formats. The FIDD determines from the diskette format whether the diskette is recorded at 48 tpi or 96 tpi, single or double sided and eight or ten sector format, and it will read any of these diskette formats in a 96 tpi drive. Thus, standard 48 tpi diskettes can be read in a 96 tpi drive.

JFormat

JFormat is the equivalent product to Quaddrive for PC-DOS version 2.0. It is written by Tall-Tree Systems of the US, but is supported in Australia by Digital Business Systems and FBN Software.

In its distributed form JFormat requires a 48 tpi for drive A. However, by using the Quadcopy facility provided as part of Quaddrive I was able to copy the supplied diskettes, together with my original PC-DOS diskettes, to 96 tpi and thus bring up PC-DOS 2.0 on an all 96 tpi system.

Quadcopy is now being supplied by Digital Business Systems and FBN Software with all copies of JFormat they sell.

EXPANDING YOUR IBM-PC

JFormat suffers from one unfortunate liability compared with Quaddrive. It does not allow an 80 track per side 96 tpi diskette to be used for the boot disk. One must either first boot from a 48 tpi diskette in a 48 tpi drive, or from a 40 track per side 96 tpi diskette in a 96 tpi drive.

In a two-drive system, JFormat creates two extra logical drives referred to with the drive letters 'C' and 'D'. Logical drive C: refers to physical drive A: and logical drive D: refers to physical drive B:. Drives A: and B: refer to standard 48 tpi drives. As drives, C: and D: will automatically detect the format of a diskette in a similar fashion to Quaddrive.

I found procedures were somewhat simplified if I included the statement ASSIGN A=C B=D in the AUTO-EXEC.BAT file. After doing this, all references to drives A: and B: will automatically detect the format of diskettes and adjust accordingly. With 96 tpi diskettes, either eight, nine or ten sector tracks can be specified. Ten-sector format provides a massive 811K of formatted data, compared with 360K on a standard PC-DOS nine-sector double-sided diskette.

Ten-Sector Diskettes

Both Quaddrive and JFormat allow for ten-sector diskettes with both 48 tpi and 96 tpi diskette drives. On all brands of drives I have tried, ten-sector formats work satisfactorily for both CP/M-86 and PC-DOS 2.0. Why then did IBM choose nine-sector format for

PC-DOS 2.0? It may be that if a drive is running slightly above its nominal speed, the smaller margin of error with ten sectors would mean the ten sectors would not fit on a track. However, I have tried ten-sector format with Tandon, TEAC, Mitsubishi, MPI and the original IBM drives – and I have had no problems with ten-sector format. If you do have problems with a particular drive, the speed may be checked easily with an oscilloscope, and adjusted if necessary.

In Summary

I have found the use of 96 tpi drives on the IBM-PC to be so successful, I have now sold my old 48 tpi drives. With the use of quad-capacity diskette drives, I have been able to successfully use the standard IBM-PC for my applications, rather than having to purchase the far more expensive XT model with the hard disk facility.

The 800K per diskette converts the IBM-PC into a usable business machine. The use of the slimline drives, together with the low power consumption of the TEAC drives, means I have both the space and power capacity to include one or two slimline five-megabyte hard disk cartridge drives in my PC, adjacent to the TEACs.

If IBM wants to remain competitive in the microcomputer field, it can only be a matter of time before it jumps on the bandwagon with 96 tpi slimline drives.

SOFTWARE REPORT CARD

Package:	JFormat			
Made by:	Tall Tree Systems			
Useful for:	Increasing the capacity of your 48 tpi PC-DOS 2.0 diskettes by 25 per cent and/or handling 96 tpi diskettes			
Hardware required:	IBM-PC with PC-DOS 2.0. A 96 tpi drive is optional but is required for 96 tpi diskettes	Excellent	Very good	Good
Ratings:				Poor
Documentation:		•		
Ease of use:			•	
Speed:	•			
Functionality:		•		
Support:		•		
Value for money:	•			
Price:	\$50			
Review copy from:	Digital Business Systems, PO Box 33, Rivett 2611. (062) 88-6520.			

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by Doug Cobb

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Applied Technology can't really be considered a leader in computer technology, but, like all successful companies in the industry, it must do all it can to stay in touch with the leading edge. Over the years we have seen a succession of upgrades and new products that have kept Applied Technology's Microbee well positioned in the marketplace, and the company's latest release should keep this computer in the forefront of the market: microdrives for the Bee.

MICROBEE - MICRODRIVES

By Evan McHugh

MICRODRIVES differ from conventional 13 cm or 20 cm drives: first in size — the disks are only 9 cm in diameter — and second in operation. The so-called 'floppy' disk is in fact housed in a hard sleeve with a spring-action 'door' that slides open to uncover the disk surface as the disk is being pushed into the drive.

Despite its small size a double-sided, double density microdrive disk can hold up to a megabyte, unformatted; this gives effective storage of around 720 Kbytes. The microdrive for the Bee, however, is single-sided, and will give you around 500K user memory.

The most startling thing about Applied Technology's microdrive is its packaging. It is contained with the Bee power supply in a metal box with a cloth cover. This creates the appearance of a book, and with the words 'Computer-in-a-box' written on the front, the analogy is strengthened. Indeed, you can treat the drive as a book, store it on a shelf and operate the drive while it is on its end. This may not be an ideal practice, but it

was the one we engaged in while testing the system and we experienced no problems. We left the drive switched on overnight, sandwiched between two big books, and there were no overheating problems or data loss.

This kind of presentation is very unlike Applied Technology; it is a much more attractive package than anything else we have seen from that company. The arrangement is very good, very marketable, and for my money Applied Technology should do more of this.

Sadly, there is one small problem. When you sit the drive in a row of books it's very hard to get to the power switch located at the back of the box, near the bottom. It would seem sensible to move the switch to the front where it is much more accessible. Obviously, this is more of an inconvenience than a serious design flaw but it would be nice to see it changed.

The microdrive is being marketed in a package with a 64K Microbee for just under \$1000. Included in this price is a CP/M operating system which efficiently operates the drives, a word processor and other utilities

such as communications and Microworld BASIC.

Upgrade Paths

Applied Technology has now clearly defined its product lines and the possible upgrade paths. According to the plan the microdrives will only be marketed with the 64K machine, which can then be upgraded to a 128K machine. The drives will not be marketed direct with 128K Bees.

The advantages of the new drive are that it's cheaper than 13 cm drives, due to its smaller size; it is quieter; and it consumes less power. The new enclosed style of diskette is also noteworthy — you'd have to try really hard to put your sticky fingers on the recording surface, which is always well encased when not in the drive. This should certainly contribute to a reduction of data losses.

So the time has finally come when you can buy quite a powerful computer with a disk drive and software for under a thousand dollars. Add to this licensing arrangements that let you buy word processing, database and spreadsheet packages for under \$100 each, and you have quite a cost-effective home computer.

NEC-ING

extract all the necessary subroutines from the partitioned data set PLILIB.L86. Here are the two linking times (both using a 10 Megabyte hard disk):

APC III	15.5 sec
President	27.6 sec

The APC III's 8086-2 and disk controller have really zipped up its performance; and this is what NEC is crowing about. As expected, the performance ratio is less spectacular when disk accessing is involved, but it is still impressive.

See How They Run

Along with the hardware was delivered a carton of software. Not that NEC bundles software with its hardware. No no. You buy it. Even the operating system. But at the prices they are charging for the hardware, who should complain?

The carton contained the following goodies, all neatly packaged, and marked with the APC III logo. All the systems had been pre-installed for the APC III.

The GW BASIC is Microsoft GW-BASIC Version 2.0. The supplied diskette rather disappointingly contained only one file - BASIC.EXE. It would have been nice to have a few sample programs, and maybe a friendly old READ.ME.

With the monochrome monitor all the graphics commands seemed to do the right thing. After a short time I had a screen crawling with lines, filled-in boxes and circles. Of course, they were all monochrome, but still quite effective. Clearly no surprises here, apart from the fact that this version makes no use of the ANSI.SYS screen handling conventions.

The MicroPro Professional package comes in two boxed manuals. A small addendum adequately explains how WordStar may be used with the various APC III function keys. It comes complete with MailMerge and SpellStar, as well as the indexing program StarIndex, and CorrectStar - the improved version of SpellStar. Since CorrectStar needs at least 192K of RAM, I was out of luck again. Nevertheless, WordStar did its thing as expected. The twin intensities on the screen provided excellent highlighting.

This was the best presentation of

the WordStar system I have seen. The documentation is excellent, and the on-line tutor is a delight. One gets the impression that a nine-year-old could happily learn quite a chunk of WordStar in just a couple of hours.

The dBase II package was also supplied pre-installed for the APC III. Rather than bust into the sealed Real Thing, I ran the dBase Tutor program to get a feel for it. Unlike the IBM PC version, dBase for the APC III (as well as all the other packages) writes extremely quickly to the screen. One of the problems with the video architecture of the IBM PC (and its clones) is the speed with which one can write to the screen. Although both the APC III and IBM PC use memory-mapped video techniques, if the IBM video memory is accessed at any time other than during a retrace or vertical blanking you get nasty splotches appearing on the screen. With the APC III, you can write to the video RAM at any time without this problem. Accordingly, screen displays on the APC III are almost instantaneous.

Unlike the previous offerings, the BPS Business Graphics package was presented with "for the NEC APC III" printed prominently on all the external casings. I didn't have the heart, nor the time, to bust it open. It looks

The built-in disk controller is sufficient for three drives; so if you have a single floppy drive system, adding the second is just a matter of mounting and connecting the new drive. The third disk drive port is already hooked up to the rear connector labelled 'hard disk' for a possible external hard disk.

Adding more memory does consume slots. Each RAM card may have up to 256K on board. Up to two fully populated cards can be inserted for a total system memory of 640K.

The optional Colour Graphics Card is mounted internally in a dedicated position, and does not consume a slot. This card expands the colour graphics screen memory to 92K, and is independent of system memory.

Other slot-consuming cards include the Joystick/Sound Card, the GPIB (General Purpose Interface Bus) card which adds a standard IEEE-488 interface, a Universal Prototyping Card, and a board with two additional serial ports. There should be few users complaining because of a lack of slot space.

Prices

The most recently (at the time of going to press) announced prices for the NEC APC III with 128K of memory are as follows:

Floppy Drives	Hard Drives	Monitor	Price (with tax)
1	—	Mono	\$2995
2	—	Mono	\$3565
1	—	Colour	\$3695
2	—	Colour	\$4265
1	1	Mono	\$5195
1	1	Colour	\$5895

neat, however. According to the back of the box, BPS draws a variety of graphic presentations, including bars, pies, lines, scattergrams, and areas. Text, grids and colours can be user determined. Source data is acceptable from Multiplan, WordStar and dBase II. BPS provides for curve fitting, smooth moving averages and distributions. A training disk is included with the system.

Also supplied, but not tested, were Multiplan and SuperCalc 3. Both are also pre-installed for the APC III.

Hardware Options

Some of the expansion options available for the APC III occupy one of the four available system slots. Others are mounted internally in special cages, or in daughter board configurations.

You can add another 128K with the expansion card which costs \$438. For another \$245 you get 128K worth of chips, to fully populate the expansion card and bring it up to 256K. The 10 Megabyte hard disk systems referred to above are mounted within the system unit. An external hard disk will set you back \$2395.

In Conclusion

An excellent performer, with good value for money. Although not an IBM clone, it seems not to suffer from a lack of MS-DOS software. It is very fast, and the graphic capabilities are first class. It is a quality product with a good back-up service behind it. The APC III would satisfy the most fastidious personal computer user, as well as the professional worker who needs a serious work horse. I like. □

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SYSTEM OBJECTIVES

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 - A. Company
 - B. Partnerships
 - C. Sole Trader
2. To compare results with budget and last year.
3. To produce the financial reports.
 1. Manufacturing
 2. Trading
 3. Profit and Loss
 4. Balance Sheet
4. To transfer the totals from the various ledgers, Debtors, Creditors sales etc.

DEBTORS SYSTEM

SYSTEM OBJECTIVES

1. Integrated with Invoicing/Stock.
2. Automatic Production of Statements.
3. Debtors Control by Aged Trial Balance.
4. Analysis of Sales Monthly & Yearly.
5. Analysis of Sales by Area/Salesman.
6. Calculate Salesman's Commission.
7. Uses Standard Stationery.

INVOICING/STOCK SYSTEM

SYSTEM OBJECTIVES

1. To maintain and control stock inventory levels.
2. To produce a detailed invoice or Credit No. on-line.
3. To analyse the sales and profitability of all stock lines.
4. To produce a complete sales tax analysis.
5. To integrate with the Debtors system and update account balances at invoice stage.
6. To produce salesman and area figures including a commission statement.

CREDITORS SYSTEM

SYSTEM OBJECTIVES

1. To produce a creditors system which can operate: Integrated with the Stock System.
2. To maintain and control the Accounts Payable section of a company.
3. To control discount available.
4. To make payments to selected creditors by the use of the aged Trial Balance.
5. To produce cheques automatically.
6. To analyse purchases from creditors month and year to date.
7. To produce the necessary totals to transfer to the General Ledger.

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THIS MONTH I thought it might be interesting to change the column format a little and give a selection of questions and answers covered by the 'trouble-shooting panel' at a recent meeting of my local Users' Group. We always have a minor session of this type, but on this night it was a major attraction and held so much interest for a wide cross-section of members present that it seemed a valuable topic. Other groups may like to copy the idea. (We copied it from the Adelaide MicroBee Group!)

Q: Is it possible to stop the tape when a BASIC program is partially loaded and still keep whatever has so far been loaded?

A: Yes. Press reset to get back into BASIC; then with a monitor loaded into high memory locate the end of the program, edit memory and put three zeros after the last part of the program you want. It should then run.

Q: Is it possible to have a double-sided drive as the second drive (drive 1) in a Model 3 or 4?

A: Yes, but you'll need a different cable to access the second side. The requirements are different depending on whether you want to access it as two separate drives (1 & 2) or one drive using both sides.

Q: Is there a reliable fix for the poor RS232 connections from the Model 1 expansion interface?

A: Some have found fitting washers to bend the board into better contact successful, others simply push it down into contact each time before they use it; the only sure way known is to replace the friction-type contacts with a soldered ribbon cable. But beware: this is certainly not a job for the inexpert solderer!

That's a Hard One

Q: How can terminal software written for a TRS be modified to run on a System 80?

A: It's so difficult that it's beyond the ability of most of us for all practical purposes. The way out is to modify the hardware. Contact John Ross, 2B Green Street, Woodville 5011, for details of what he has available both in kit form and as whole units.

Q: What causes variation of speed in disk drives?

A: Excluding a faulty motor (rare, but not impossible), it could be over-zealous owners using a grease which is temperature-dependent; a stretched belt; a dirty belt; or the diskette jacket having

been squashed (in the post) so it puts too much friction on the diskette to allow it to turn freely.

Q: How do you put certain selected Disk BASIC commands into Level 2 BASIC?

A: Apart from writing it all yourself (the actual Disk BASIC is so convoluted it can't just be copied) and patching it in using the addresses given in a ROM manual (such as the excellent one available from Micro 80), the only extended BASIC we know of which allows customising to individual requirements is 'Custom BASIC for '80 Users' from Warwick Sands, 1/19 Gable Street, Mackay 4740 (\$50).

Failing Memory

Q: Why does memory fail only when nearly full?

A: Programs such as VisiCalc which use almost all available memory are indeed a good test of memory which otherwise seems all right. Another test is a self-calling GOSUB. The old question of bad contacts being cured by installing gold contacts is probably not the answer, nor is checking the cable to the interface, but neither will hurt.

Q: What causes the outside tracks to be locked out when formatting a diskette?

A: There is an adjusting screw to set the limit of travel of the head in both directions. Often a temperature variation will change the ability of the head to access either inside or outside tracks, but this is in reality an inaccurate setting of the limit screw.

Q: What is the procedure for using the RS232 in the Brother typewriters?

A: First check your model actually has an RS232 in it — the advertising has been misinterpreted by some who've purchased the model without when they didn't mean to!

Why, Oh Why?

Q: Why is the FORMS command in DOSPLUS so difficult to use?

A: There does seem to be a bug in versions earlier than 3.5, and even in 3.5 the printer will still override the setting unless certain precautions are observed.

Q: Why is the Dick Smith Dataphone so erratic in its operation?

A: Dick was offering a free modification to a poor-design fault; there are also numerous pots to be adjusted, but these can be traps for the unwary. Contact

John Ross at the abovementioned address.

Q: How do you transfer files from TRSDOS to DOSPLUS with a one drive system?

A: There are some problems which may be overcome with perseverance and reading of the manual. Probably the easiest way is to visit someone with a two-drive system and who is familiar with both TRSDOS and DOSPLUS. Yet another good reason to belong to your local users' group!

Q: Why is there sometimes a problem when loading source files into EDTASM+?

A: A common trap is to forget to delete the source code already in the buffer (assuming it's not required) before using the L command. This will add the source code from the tape to the end of the previous contents of the buffer, but if line numbers are duplicated many horrendous happenings can result. If you've worked on the text just loaded, you can try re-numbering in an effort to save something.

These questions and answers serve to show the wide range of expertise available from members of a users' group. Most groups of which I have experience provide a list of members with particular areas of specialist knowledge; so even though they might not hold regular trouble-shooting sessions such as the above, there is still a wide range of help freely available.

Speed Up Modification

I've received a letter from Graham Kirkman, 28 Monument Street, Mosman Park 6012, detailing the changes he's made to the 50 per cent speed-up modification in *The Custom TRS-80 and Other Mysteries* by Kitsz. For a free copy send a stamped self-addressed envelope to Graham.

There appear to be several features lacking in this method as compared with the commercial kits available (for example, hardware switchability, and automatic reversion to normal speed for I/O operations). The kit available from John Ross (see address above) does provide automatic standard speed for disk or tape operations, and can be fitted with a hardware switch. It costs \$12 in kit form, or a minimum of \$50 fitted; actual fitting costs vary with the various models of main circuit board, and are partly dependent on whether it is necessary to change RAM chips if the slower

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early memory upgrade has been used. There is usually no problem with System 80s or the American Model 1s, but some Japanese Model 1s can be difficult. Speeds are (the standard) 1.77, 2.66, 3.5, 5.0. It will even run Stringy Floppy at 5.0 MHz!

Book Review

My copy of *Learning and Teaching Programming Using the TRS-80 Model 3* by Nancy Lee Olsen (published by Howard W Sams) came from Prentice-Hall of Australia and is priced at \$17.50.

At first it's difficult to make out the target audience of this book. The author offers it "for those who want only a little familiarisation with computers", and in this I'd agree — it does introduce rather than teach. While the drawings and photos and 'talking down' seem aimed at young children, there is a special section on teaching such young children, as though the whole book is meant not for them.

The author has apparently had much experience in teaching computing to children, and says this book was developed from her own teaching notes. I think it remains just that — notes for an accomplished teacher to use, rather than a complete teaching text.

The last of the three main sections in the book is titled 'Intermediate Programming', but goes only as far as flowcharting (not exactly a subject to rivet anyone's interest, and certainly not that of younger children) and debugging. It also gives a table of cursor control codes without examples of how to use them. I feel it's a pity this so-called 'intermediate programming' section warns that the reader may have difficulty coping with concepts which are in truth not difficult — preconditioning to failure?

The real value I see lies in the book's seven appendices, which help to make it a valuable resource. The other value of the book is in stimulating the teacher's thoughts. There are some accounts of the author's personal teaching experiences: I'd have liked more.

In summary, I'd say this is a book to add to one's already large collection, rather than for use as introductory information.

Software Review

'Custom BASIC for '80 Users' is available by mail from Warwick Sands, 1/19

Gable Street, Mackay 4740, and costs \$50.

This program is essentially a set of utilities to allow the implementation of most of the useful facilities of Disk BASIC for tape users with a Model 1 or 3, or System 80 with 16K, 32K, or 48K. (Warwick has a System 80, and I've noticed it's the System 80ers who seem to do more of this type of 'development' work.) The method is to choose which of 25 modules you require, then make a tape containing only those. This process takes less than an hour and once done, the 'Customised BASIC' tape is prepared for future use in your system; although I must admit that the choice is from such powerful functions that some good thought is required to refrain from using the whole lot at the expense of memory.

A feature of great value is that the author gives his home address, with an invitation to contact him by phone or in person to report any problems, or just to give him your thoughts. He seems quite a fountain of programming knowledge; a 'free' benefit to the purchaser of the program. The result of this feedback from users is already evident in the upgrades added to later versions.

The very comprehensive and useful (it contains examples of how to use the functions) manual was all produced on Warwick's printer, and those who've tried to produce bit-image graphics will know it's not easy. A pity there's no section in the manual on this art — I've suggested one!

As well as the aforementioned Disk BASIC functions there are several not usually found: a software spooler (as in LDOS); shift-key abbreviated commands (key stroke multiplier as LDOS); swap memory to save screen; reduced leader for tape files; advanced use of VARPTR; and complex graphics commands.

The paradox is that this program is very good for the advanced BASIC programmer, but those advanced enough to make full use of all the facilities are likely to have Disk. And for those, there is a section on how to incorporate it into a DOS, as well as how to use it with Stringy Floppy.

Certainly I recommend this program over any of the American competition; not only does it have more features, the great advantage is that it is made to be customised by the actual user.

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TI99/4A: With extended BASIC, a personal record keeper, and over \$200 worth of games and books — worth over \$800, will sell \$500 ono. (02) 627 4843.

Microbee: 32K colour, including over 30 programs — will take the best reasonable offer. Contact RJ Castles, Orange; phone (063) 65 1136.

Monitor: Hi-res amber 30 cm monitor. Brand new with warranty card. Top quality intra with IN/OUT and HI/LOW switches. Suit most computers. \$185. Phone (057) 84 1926.

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Wanted: Someone with whom a software exchange for the 48K ZX spectrum can be arranged. Phone Brad (069) 62 2381.

Apple II +: With B&W monitor, disk drive and GP-80 printer. Software and books including Lisa 205, GrafPak 1.0, Micro Apple Vol 1 & 2, and spare diskettes. Sell for \$2200 ono. (047) 51 4440.

Floppy Disks: Professional-quality SSDD 13 cm diskettes — \$24 for a box of ten, plus \$2 postage per box. Phone Peter on (02) 349 6319, or write to PO Box 448, Maroubra, 2035.

Multilink Multi-User System: For the Commodore 64. Hardly used. Special deal — \$700. Owner desperate. Phone Andrew Farrell on (02) 93 5123.

Wanted: Pascal, C and Fortran compilers for TRS-80 Model I Disk System, also any other disk software or information on public domain software. Write to Stephen Pfundt, 40 Treloar Crescent, Braybrook 3019.

Computer of the Year: A complete NEC APC system with printer, numeric processor, mobile terminal stand and CP/M-86 software. In top condition; used only at home for (successful) postgraduate work. Well under replacement price at \$4758. Phone (02) 477 6119.

Commodore 64 Software: Musicmaster 64 — a complete music programming language that makes C64 music generation simple. Alpha Attack — an arcade-type typing tutor. Lazer Tanks. All three for only \$10. Send mail order to Stephen Meacher, 13 Rennison Road, Newhaven 3925.

Computer Teaching Workbook: On programming in BASIC. It is based on teaching courses at technical colleges, including the subject 'Data Processing Concepts'. It is strong on flow-charting concepts and is very helpful for beginners and semi-professionals. Just published by a teacher in electronics. \$22 each. Phone Maurice on (02) 30 7988 (please leave name and phone number after the recorded message).

Microbee: 32K model II with Editor Assembler ROMs, \$150 worth of game software, many books and manuals. The lot for just \$499. Be prompt. Contact David on (043) 41 4558.

Atari 600XL: 16K with Atari datacassette, all leads, manuals, and some magazines — \$300 ono. Phone Paul on (02) 389 6388.

Sorcerer 48K: With BASIC, BASIC Compiler, word processor, development pac, cables, manuals, cassette software. Excellent condition. \$690. Phone (02) 371-7729.

Microbee: Tapes or listings — Hyperspace and Grand Prix, or Tennis and Squash. \$50.00. T.B. Knowler, 5 Keane Place Fraser 2615.

Wanted to Buy: Broken-down Apple or compatible computer. Write Mr G. Santa Ana, 25 Palona Street, Marayong 2148.

Apple Arcade Games for Sale: For a list write to Jamie Ogden, 493 Alice Street, Maryborough 4650. Phone (071) 21 3885.

Apple Software: Wanted, a copy of Genesis (the adventure game). Will swap for many arcade games. Contact MATICS, PO Box 60, Warragul 3820.

Sharp-700 Courseware: Lively, colourful, accurate simulations; Palmer Goldrush; Halley's Odyssey; Spacegames Twentypack. \$20 each. Lawrie Williams, Box 346, Malanda 4885.

Modifications, Repairs and Upgrades: To home computers, specialising in Microbee and Apple II (or lookalike). Also burn EPROMS, and build and repair add-ons. Rates from \$15 an hour, plus parts and travel. Fix 'n' Chips, Petersham, NSW. Ring Lindsay on (02) 569 4410; 8 am — 10 am, 5 pm — 9 pm.

Microbee: 16K, with Tandy Green screen monitor, tape recorder and some software — \$495 ono. Phone (02) 498 5991.

TI-99/4A Software: 'Starlord' (Extended BASIC) — puts you in the cockpit of the D-48 Stardragon to hunt down enemy craft of seven different designs, and rise in rank and power. Includes 16-page manual — \$12.50 post paid. Phone John Smart on (049) 33 6003.

Computer Club: Anyone in Cooma area interested in forming a club? Please contact Stephen on 2 2871, or Bill on 2 3364.

For Sale: Memotech MTX-512, \$750; DGZ80-CPU, \$100; DG640-VDU, \$100; keyboard and enclosure, \$50; Dick Smith monitor, \$100. All prices negotiable. Phone Cliff (02) 604 3819 ah.

Kaypro: Plastic keyboard overlays for dBase II, WordStar, Perfect Writer and Perfect Calc — \$19.50 each. Vanguard Enterprises PO Box 25, St Marys 5042.

CP/M Users: Anyone who can assist me to rewrite standard call functions for MBASIC or Nevada FORTRAN to 16-bit precision at Z80 code level on a Microbee, or knows where to get necessary software, please contact John Van Cooten 28 Bringelly Street, Arana Hills, Brisbane 4054. Phone (07) 351 6363.

For Sale: Apple II + with 48K RAM, one disk drive, Kaga colour monitor, Apple graphics tablet, IBM (MX80) printer, and over \$1000 worth of programs — \$3200. Phone (02) 487 1764.

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BBC EPROM Monitor: \$47.50 for manual, 8K assembler, disassembler, with file, disc sector editing, and so on. Contact G.J. Armitage, 8 Menzies Parade, Lalor 3075. □

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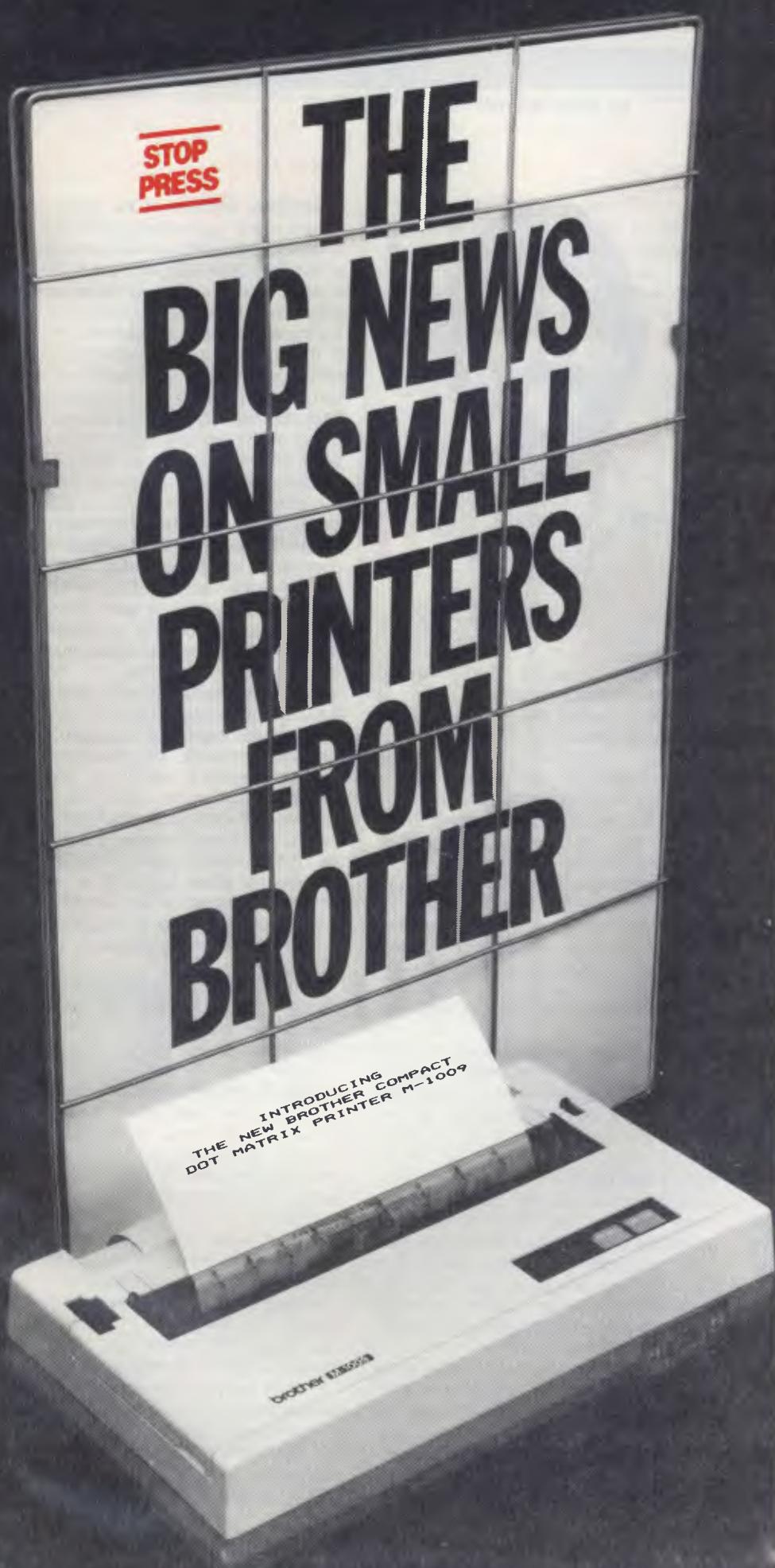
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WELL, I'VE been lucky enough to have a 128K Bee with dual drives on my desk for a couple of months now; I have to thank Owen Hill of Applied Technology for giving me the opportunity to try it out. Life may never be the same again! At least now I can begin to answer some of the questions pertinent to the disk-based Bees.

Along with the computer came a BeeModem. Naturally it was impossible to resist trying it out, and 2 am found me still listening to 'busy' signals from the Sydney RCPMs. I finally managed to get into an interstate RCPM and had a bit of a look around. An interesting pursuit, this, but a little expensive when all calls are STD.

Actually, the reason for my excursion into the depths of networking was to scrounge enough information to answer some questions about the program called MODEM7 or MODEM7A. Apparently there are a few people out there having some difficulty with this modem program. So did I at first, but by experimenting, asking the right questions and reading the documentation on this modem program, I ended up with the following answers.

The command which will either select or deselect the disk-save facility is CTRL-Y. This command is used once you are in TERMINAL mode and, in fact, acts as a toggle to select the material which will ultimately be saved on disk. You can tell when this command is on because the material which is to be saved is preceded, at the start of each line, by a colon. Provided the correct exit sequence from MODEM7 is executed, then all the flagged information will be saved.

The initiation sequence for MODEM7, once it is loaded in from disk, is:

T fn.ft – enter terminal mode and create the optional file fn.ft.

Ctrl Y – turn on disk-save option. From here, call up the RCPM, carry out your planned activities and once you've said **BYE**, use the following exit sequence to save your entire transaction to disk:

Ctrl E – to leave TERMINAL mode.

WRT – writes the currently open file to disk.

CPM – closes the file and returns to CP/M

Once back in CP/M, you can use the **TYPE fn.ft** command to display the text resulting from your call.

To download a file whilst in TERMINAL mode, execute the following sequence of instructions:



XYAM – invokes the communications program on the RCPM.

S fn.ft – instructs the RCPM to send the specified file to you.

Ctrl E – exits from terminal mode.

R fn.ft – instructs your system to receive a file and assigns the specified name and file type to it.

If all proceeds well, a message appears, indicating the time it will take for the transfer to occur. After the transfer, a further message will appear, hopefully indicating a successful file transfer. Once you have control again, you can return to TERMINAL mode with the command **RET**.

To the best of my knowledge, the preceding is correct; however, if anyone has any embellishments or criticisms then please don't hesitate to let me know.

Utility Reviews

Dreamcards Software has released, under licence, two items of software which are designed to enhance the features of both Microworld BASIC and EDASM. The programs are two separate ROM-based key-screen editors to allow direct on-screen editing of BASIC and EDASM files.

Each utility is supplied in a separate 4K EPROM which is intended to reside in the NET EPROM space (E000H+). When the BASIC Editor is installed, it is accessed by means of the NET command, whilst the Assembler screen editor is accessed directly from EDASM.

Each editor implements the same set of control-alpha commands (with one exception) to allow full on-screen editing of a file. The user may edit out a letter, a word or even a whole sentence with the press of two keys, and instantly retrieve it if the erasure was accidental.

There are some features provided within the Assembler Screen Editor that can tie it in simply as an extension of EDASM. The author of the program has found that there is enough room within the EDASM EPROMs to effect a small modification which will permit the addition of two extra commands to EDASM. He (or she?) details the methods which permit EDASM to be provided with a command to access the Assembler Screen Editor as an EDASM function. The other command is used to execute an initialisation routine or a parallel printer so that one of the deficiencies of EDASM can be overcome.

The documentation consists of a number of printed, stapled foolscap sheets – nothing fancy, but clearly written and complete, fully detailing each command.

Each editor in EPROM, with documentation, costs \$39.95. Not cheap, but then things of value rarely are. If you write more than the odd bit of software, either in BASIC or Assembler, then at least one of these EPROMs is worth plugging into your EPROM expansion board or piggybacking into the NET socket.

The BASIC Screen Editor and the Assembler Screen Editor are available from Dreamcards Software, 8 Highland Court, Eltham North 3095.

BASIC To Wordbee Transfer

If you have the need to load BASIC programs or their output to Wordbee, the following information from Greg Bradley of Mackay may be of value to you. To perform the transfer from BASIC to Wordbee:

1. First enter the BASIC command **OUTL#3 (RETURN)**.
2. Enter **LPRINT CHR\$(13)**.
3. Start the cassette recorder on 'record'.
4. Press **RETURN** and stop the recorder when the prompt appears.
5. Start the recorder again and **LLIST** the program, or redirect the output you require to the cassette at 1200 Baud.
6. Stop the tape when the prompt reappears, and if you had to use **OUT#3** in step 5, use the **RESET** key.

7. Give the BASIC command OUTL#3 (RETURN).

8. Enter LPRINT CHR(26).

9. Start the cassette recorder on 'record'.

10. Press RETURN and stop the recorder when the prompt appears.

You have now saved the program to tape in standard ASCII format. The CHR(13) at the beginning will tell Wordbee to prepare for the incoming text and the CHR(26) will return control to the keyboard.

To get the data into Wordbee, do the following:

1. Rewind the tape.

2. Enter the commands IN#3:EDASM and press RETURN.

3. Press the play button on the recorder.

You will see the program load, and once it has finished the cursor will start flashing. You will probably find a few blank lines at the beginning and end, but it is easy to delete these. After cleaning up the program, press the LINE FEED key and Wordbee is at your command.

I have found that sometimes, if the program lines are particularly long, this method of loading BASIC listings into Wordbee may drop a line or two. This may be remedied by using OUT#3 on instead of OUT#3, which provides Wordbee with the time it requires to digest input at 1200 Baud.

There you have it. Thanks, Greg.

BOOK REVIEW

Title: *Getting started on the Microbee*.

Author: Peter Lukes and Tim Hartnell.

Publisher: Pitman

RRP: \$9.95.

The authors of this book assume that the Microbee is introducing the reader both to computers and programming, and consequently the book is written from the basics onwards.

It should be pointed out first off that there are a number of topics in BASIC that are either treated lightly or not dealt with at all. This may simply be in keeping with the title of the book, but I will list them all the same.

PEEK and POKE, two very important instructions, are touched on only very lightly, although their functions are defined.

Mydas Assembler

Those of you who use the Mydas Assembler may be interested in the following information supplied by David Safarik of Palm Beach in Queensland, detailing the jump vectors for the commands used in this assembler.

Thanks for that, David.

I need to know the jump vectors and the work areas for the maths and trig routines in Microworld 5.1 BASIC. If anyone has ever unearthed that particular information, then I would be pleased to hear from them. □

JUMP VECTORS FOR COMMANDS USED IN THIS ASSEMBLER

COMMAND	JUMP VECTOR	EN	DB45
EDIT	C1AB	M0	DB6F
ASM	CB82	GO	DBB0
RUN	C1BF	BA	8000
SSRC	DEB6	LO	DDB5
MERGE	DDB2	DA	DBD1
CP	C177	EA	DD79
SPS	C1B0	SA	DED2
SFF	C17C	F1	DC57
OFF	C1B4	SE	DCFC
DU	DAD4	CO	DCB6

The USR function receives no mention that I could find and likewise trig and math operations are not discussed.

One feature of the Microbee is its high-resolution graphics, but unfortunately, *Getting Started...* limits its involvement with graphics to a brief mention of the low-resolution SET and RESET instructions. Of HIRES, PLOT and POINT, there is a naught. All screen drawings are executed by means of ASCII characters in PRINT statements.

My main gripe with the book is the fact that it has no index. This has the effect of making it somewhat tedious to find the information pertinent to a specific command. However, each occurrence of a BASIC command is capitalised, and this does make it a little easier to spot them as you flick through the book.

The remainder of the Microworld BASIC commands are treated in a straightforward manner; there don't ap-

pear to be any lapses into the jargon which confuses absolute beginners. An example of the book's clear approach is the chapter on arrays, which makes one of the trickier areas of BASIC a bit easier for the learner to follow.

Throughout the book, programming examples demonstrate the behaviour of specific instructions and groups of instructions. As well, the operation of each program example is examined in detail in the text. Some of the examples are actually quite entertaining games, too.

As a beginner's introduction to Microworld BASIC, this book is perhaps a bit more reader-friendly than the BASIC manual supplied with the machine, insofar as it guides the reader through from first principles to the more involved operations in an easy-to-follow style. It could use an index, but even so, *Getting Started...* would make a handy companion for your Microworld BASIC Manual.

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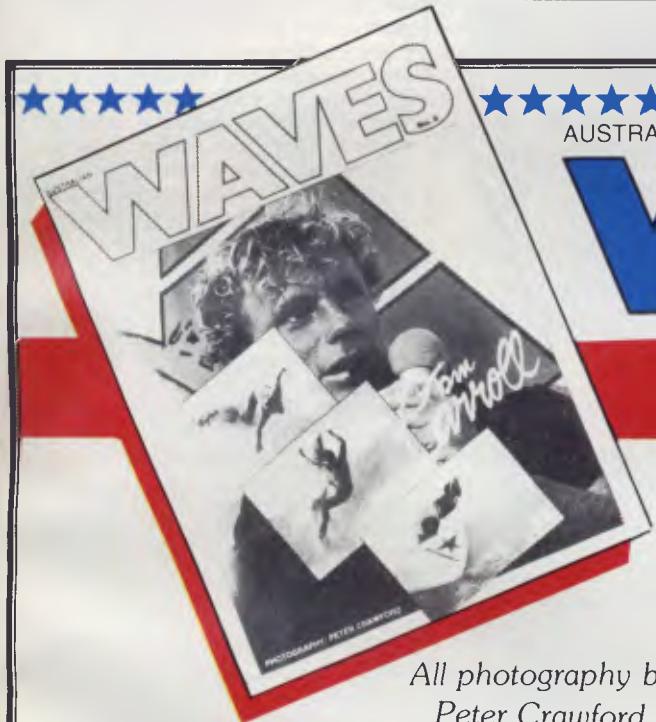
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